The Benefits of Cochlear Implants (CI) for the Educational Progress and Placement of Deaf Pupils at Primary School in Riyadh, Saudi Arabia

Volume 1/2

Mohammed Albanyan

PhD

University of York

Education

December 2015

Abstract

This research explores the benefits of cochlear implants (CI) for the educational progress and placement of deaf pupils at primary school in Saudi Arabia (SA). It also examines factors that might affect these benefits. This study provides an insight into the current situation of the educational status of deaf pupils with CIs in Riyadh in SA.

Pilot study was conducted in order to examine the clarity of the research questions, instruments contents and structure. Amendments were made according to the findings of this pilot study.

Participants comprised parents, teachers and clinicians' perceptions, experiences and school academic report are involved by using semi structured questionnaires and interviews data. One hundred and ninety-six participants are from fifteen primary schools and one hospital. Key features highlighted advantages and disadvantages of CI, educational performance level of deaf pupils with CIs and compared to deaf pupils without CIs, availability of inclusion within mainstream classroom for deaf pupils with CIs and the factors might affect such educational progress and placements.

The majority of parents, teachers and clinicians stated that CI has positive outcomes on the deaf child and benefits upon the educational progress. A substantial difference before and after surgery for better in improved hearing, educational achievement, language and speech, psychological and social aspects, more potential for inclusive education and greater independence were stated by parents, teachers and clinicians as advantages gained by their children/pupils/patients using CI.

Analysis of data showed a notable discrepancy between participants' experiences regarding the benefits of CI and the reality of the children educational progress and placements. The majority of pupils with CIs are studying in the year below the year that they are supposed to be at for their chronological age. Also, respect to the educational placements settings, the majority of pupils with CIs involved in this study are educated at units/classes attached to mainstream school but not within mainstream classroom where their hearing peers are. The study identified the factors affecting the benefits of CI, not only those that are related to the cochlear implants themselves, but also school-related factors and the role of administration and awareness, which seem to be dimensions that affect the outcome of CI in the Kingdom. Implications are discussed in view of findings.

Table of Contents

Volume 1/2

List of Tables

List of Figures

Acknowledgements

This piece of research would never have been completed without the guidance and wisdom of God the Almighty (Allah). My gratitude is extended to my supervisor, Dr Poppy Nash, for her on-going encouragement and guidance which was essential for the completion of this thesis. I owe my wife and my children a great deal for their patience, constructive inspiration and encouragement at the most difficult times. My love and deepest thankfulness go to my mother for all her prayers and to my late father may his soul rest in peace. Also, I thank my family, brothers and sisters, friends for their moral support. My gratitude also includes my Thesis Advisory Panel (TAP) Professor Chris Kyriacou for providing his valuable advice and comments throughout my PhD journey. My thanks are due to my former second supervisor, Dr Gill Hampden Thompson, who gave guidance on the initial grounding of the methodology framework. I would also to acknowledge the help of Professor Abdulrahman Hajar at King Abdulaziz Hospital in Riyadh, for his productive assistance and critical remarks about my thesis. My thanks also go to my colleague at University of Shaqra, Dr. Saad Alamer for his help and support. I wish to acknowledge the support of Buthaina Albanyan for her help given in translation and back translation of research instruments. I wish to thank everyone who gave their love and support to me on this long journey. Last but not least, I must acknowledge the government of Saudi Arabia for their generous funding of my studies in the UK.

Declaration

I declare that the work presented within this thesis is entirely my own and that all the material in this thesis which is not my own work has been identified. This work has not been submitted in part or fully for examination towards any other degrees or qualifications. All sources are acknowledged as References.

Chapter 1: Introduction

‘‘Here is a deaf child, perfectly normal in every other way; don't be afraid of him. Talk to him. Include him’’ (Froude, 2003, p. 34).

1.1 Background

This introduction starts with a definition and explanation of deafness and hearing impairment in children and its implications. In order to describe the developmental outcomes of cochlear implants (CI), it is first necessary to discuss hearing impairment in Saudi Arabia (SA) and evaluate the education programmes available for deaf pupils. Secondly, the perception of early identification, implantation and intervention and their implications in terms of the benefits of CI are highlighted. Intervention programmes and the current situation in Saudi Arabia related to cochlear implants and the situation of other early intervention programmes currently available are also reviewed, pointing out their strengths and weaknesses. A brief outline is presented of what a cochlear implant is, its benefits, for whom it is intended and the difficulty of predicting factors and individual differences. These aspects are further discussed within the literature review in Chapter 2. The structure of the thesis is outlined at the end of this chapter.

1.2 Deafness and Hearing Impairment

Hearing is considered a vital component of our five senses. Sounds in the world around us, people’s voices and their words can be accessed by hearing. According to Werngren-Elgstrom, Dehlin and Iwarsson (2003), about one child per 1,000 of the total world population is deaf or is suffering from hearing impairment. The World

Health Organisation (WHO) (2015) states that 360 million people (over 5% of the world's population) have a hearing disability.

Children who are defined as having a hearing disability have hearing loss greater than 30 dB (sound is measured in units called decibels dB) in the better hearing ear (WHO, 2015). According to the medical classification, there are two types of deafness. The first type is referred to as pre-lingual deafness. It occurs before the acquisition of the native language and includes deafness acquired between birth and three years of age. The second type is classified as post-lingual deafness and occurs after language has been acquired. Further information regarding deafness definitions, causes and types are presented in the following literature review chapter.

Many policies and government Acts that describe or define special educational needs (SEN) are based on intensity of disability, hence the labelling of disability in terms of severe, moderate and mild. However, according to the SEN Code of Practice followed in the UK (Department for Education and Skills, 2001, p. 6), children with SEN are defined based on their needs, rather than the kind or intensity of their disability, as follows: "children have special educational needs if they have a learning difficulty which calls for special educational provision to be made for them". Lindsay (2003, p. 3) claims that:

> The generic term SEN has been widely used in the UK for nearly 30 years to cover all children who have developmental difficulties that affect: their learning; their behavioural, emotional and social development; their communication; and their ability to care for themselves and gain independence.

Moreover, the SEN Code of Practice also focuses on ensuring that children with special educational needs receive priority in and an opportunity for education, without any form of discrimination or segregation (Department of Education-DfE, 2015). It should be noted that from September 2014 the SEN Code of Practice was

superseded by Guidance on the special educational needs and disability (SEND) framework for children and young people. Therefore, the different points of view regarding the definition of deafness might indicate that a degree of discrimination or segregation could be inferred. Lindsay (2003) claims that disability categories were intended to be replaced. However, although they have changed, they continue to be used.

With respect to the characteristics and implications of deafness for children, it is argued that the most critical issue is that understanding fluent spoken communication in all or many social situations may be difficult for deaf children (Geers, 2006). In addition, using sign language, for instance British Sign Language (BSL) or Arabic Sign Language in SA, as a main mode of communication is viewed as a characteristic of deaf people, whereas hearing-impaired people can acquire some speech. Therefore, interacting effectively with people can be very difficult in the absence of language. Bittencourt, Francozo, Monteiro and Francisco (2011) argue that consequences of deafness can affect not only individual concerned, but also their families.

It is suggested that priority should be accorded to removing the medical, social, educational and psychological barriers for children who are deaf or experience hearing difficulty, rather than to adapting the definitions or labels that are applied to them. A fundamental issue is the assumption that deaf students could learn as much as hearing students if communication barriers were removed. However, Carty (2010, cited in Swanwick and Marschark, 2010), has argued that there is an unnecessary gap between deaf studies and deaf education. Thus, it is the current researcher's belief that such barriers could be overcome by a combination of early identification of

deafness, provision of early intervention programmes and greater attention to educational environment support might provide effective solutions for children with deafness and hearing difficulties. Cochlear implant (CI) surgery is one of form of early intervention which will be detailed later in this chapter (Section 1.4).This assertion regarding removal of barriers is discussed further in this thesis.

1.3 Hearing Disability in Saudi Arabia

1.3.1 About Saudi Arabia

Saudi Arabia is located in the far south-west of the continent of Asia. It occupies the bulk of the Arabian Peninsula, contains 13 major areas and has a population of 27.173 million (Ministry of Foreign Affairs, 2012). It is the foremost oil-producing country in the world and has the greatest reserves of oil (Ministry of Foreign Affairs, 2012). In taking advantage of these resources, significant amounts of money have recently been injected by the government in order to care for the health, education and social welfare of people living in Saudi Arabia.

Access to education in urban, rural and mountainous areas in Saudi Arabia is considered a fundamental human right for all pupils, with or without special education needs; these rights are guaranteed by the Saudi Arabia government (Ministry of Education, 2011). A variety of services has been provided for people with special needs by three ministries: the Ministry of Health, the Ministry of Social Affairs and the Ministry of Education. A number of international and local Acts and laws have been approved by the government to ensure the rights and care of children. For instance, in 2000, the Care and Rehabilitation of Persons with Disabilities Act was established; the Council of Ministers also approved the Convention on the

Rights of Persons with Disabilities and its Optional Protocol, adopted by the General Assembly of the United Nations in its resolution 61/106 dated 24 January 2007.

Services that have been provided by the Ministry of Education are discussed here in more detail for two reasons. Firstly, these services have a major impact on the development of a child in all aspects of his/her life. Secondly, the Ministry provides a wide range of services throughout a long period of a child's life. Regarding services which are provided by the Ministries of Health and Social Affairs, it is important to point out that these two ministries play a crucial role in dealing with children who are defined as having special needs, but at a specific time and with particular and limited services; these services are highlighted in section 1.4.2 of this chapter. The different services and support, for deaf pupils with CIs, provided by these ministries is highlighted and presented here.

It is undeniably true that charity organisations and private companies in Saudi Arabia have played a significant role in supporting special needs programmes. This support, depending on criteria for eligibility, is delivered through free rehabilitation associations and financial support accorded to families of children with special needs and to government special needs programmes.

1.3.2 Special Education and Hearing Disability in Saudi Arabia

There has been substantial improvement in Saudi Arabia, in terms of special education concepts and practices, compared with other Arabic countries. The overall development of the country economically, socially and culturally in recent years has played an important role in such improvement regarding special education concepts and practice. However, this development has not achieved the desired effects in terms of accurate diagnoses, the effective early identification of deafness and early

intervention programmes and inclusive education, which may be described as a global aspiration.

Weber (2012, p. 85) states that:

> Although special needs schools (schools for the blind and deaf) have existed in the Middle East and North Africa (MENA) region since the 19th century, special needs education has only recently been introduced in the Gulf region due to the novelty of public education itself.

According to Al-Mosa (1999), the actual establishment of teaching students with SEN in Saudi Arabia took place in the 1960s in a segregated format. The creation of the first institute for the blind was in the capital city of Riyadh in 1959/60 and comprised five classrooms, three of which were for vocational education. In addition, the first two institutes for pupils with impaired hearing, named Al-Amal Special Schools, were established in Riyadh in 1964. There were just 41 pupils studying in these institutes (Al-Mosa, 1999). Then there came a number of special primary schools which covered the age range of 6 to 12 years old, while secondary schools ran from 13 to 15 years old and high schools between 16 and 18 years old.

From the researcher's experience, the above-mentioned special schools were receiving students who were older than the age that is set for each stage, because of a delay on the part of their families in enrolling them in schools. It is worth mentioning that other groups of children with other disabilities (that is, those who are disabled or have intellectual disabilities) were taught in special schools; these were based on disability categories. Moreover, it is noticeable that these special schools started in the capital city and then spread throughout the Kingdom (Al-Mosa, 1999). Within a few years, special schools were established in other cities in order to eliminate the difficulties that encountered by pupils and their family when traveling to the capital.

Despite learning pupils with SEN being conducted in separate buildings which were fully segregated for these pupils, the focus was on encouraging families to allow their children to be educated. This challenge related to the perceptions towards disability held at this period of time (United Nations Children's Fund [UNICEF], 2010). For example, some parents refused to send their children with special needs to school, regardless of the form of education, because of the family's fear regarding their child's inability to cope in school or, on other occasions, because of the stigma attached to having a child with any form of disability. Ashencaen Crabtree (2007, p. 49), in a study of care-giving by Arab Muslim families of children with developmental disabilities in the United Arab Emirates (UAE), found that "In common with other Middle Eastern countries, social stigma is prevalent and this impacts upon the disabled child as well as the mother". However, existence of family resilience, which is supported by the influences of religion, in addition to enhanced social development in the Gulf region, this negative social stigma situation was improved (Ashencaen Crabtree, 2007).

Subsequently, there was a significant change in 1997 in the conceptualisation of delivering different special education programmes for pupils defined as having SEN within mainstream schools, rather than in special schools (Al-Mosa, 1999). In 2009, the number of special programmes in mainstream schools increased sharply, reaching 2,119 programmes and 30,618 pupils in the different stages of these programmes (Ministry of Education, 2012). However, these programmes are units or special classrooms attached to mainstream schools, rather than including these pupils within mainstream classrooms. As a consequence of the large area of the Kingdom and the long distances to the main cities where special schools are located, providing special education services in the form of integration through public schools that already exist

in cities and villages could be a substantial factor. This factor encourages parents to support their child's education and also to be comfortable about the idea of sending their child to school.

Regulations for special education programmes (governmental and private) were approved by the General Administration of Special Education (GASE), Ministry of Education No. 1674, in 2002. These rules fall into 11 sections, comprising 102 articles containing all matters related to special education. Special education programmes are defined under Article 34: ''a special classroom is a classroom in a mainstream school where a specific category of students with special educational needs receive an educational programme, most or all of the school day''. Therefore, the majority of pupils with special needs with different individual needs receive their education in integrated units in mainstream schools. Article 4 of the regulations defines a deaf child:

> These children being the focus of this study, as one whose degree of hearing loss is 70 dB or more with the use of a hearing aid, whereas a hearing-impaired child is one with hearing loss ranging between 25 and 69 dB.

The above programmes (special education programmes) established integrative education and somewhat changed the teaching methods of these children. This could have a positive impact from a humanitarian point of view. From the research experience, if a family has a child who needs to be educated in a special programme and another who is able to attend a mainstream school, these brothers (the research focused on boys for reasons that will be explained later in the study) would be able to learn in the same educational institution. Although such integration does not represent fully inclusive education, it could enhance awareness of disability and inclusive education. Ashencaen Crabtree and Williams (2013) indicate that

perceptions towards disability and education in Arab societies have changed and developed recently. Ainscow (2006) argues that values which enhance inclusion are practice, culture and policies. Thus, such values should be taken into consideration to enhance the inclusive education in SA.

This situation also results in improving social relationships between the family and the community and particularly provides a child who has special needs with the opportunity to access and engage with society. However, this type of educational setting was and remains one of integration, rather than being fully inclusive, which is inadequate as a desirable educational environment for pupils. That is, such a situation might contradict inclusion because it is claimed that eliminating social exclusion, which is considered the aim of inclusive education, is a consequence of attitudes and responses to diversity in ability, ethnicity, race, gender, religion and social class (Ainscow and Cesar, 2006; Vitello and Mithaug, 1998).

Having provided an overview historical of the educational services provided to students with special needs, specifically for deaf and hard-of-hearing (D/HH) pupils in SA, it is necessary to describe educational placement of D/HH children. A limited trial of inclusive education practices has been run in SA to include some pupils who could cope with a mainstream classroom. For example, based on the permission that was given to the researcher by the General Educational Administration in the Eastern Province of SA, some hearing-impaired pupils have been included within classrooms with pupils without hearing impairments. It is pertinent to point out that such a positive trial seems to be enhanced by supporting factors such as family involvement, awareness programmes and early intervention programmes that improve skills and cognitive ability.

A new experiment is also currently taking place in SA involving pupils with mild and moderate hearing loss and those with speech disorders, in order to include them in mainstream classes. The experiment involves pupils studying in special classes within mainstream schools at the primary stage and then attending inclusive classes at the secondary stage. The rationale behind this experiment is that pupils will improve their skills and learning ability if they attend special classes as a foundation which might be helpful when they move into inclusive classes. In addition, some hearing-impaired students and those with autism, have been included in mainstream schools directly from the first stage of school (primary), depending on their ability to engage with lessons. However, despite the support and encouragement that may be offered to pupils who are considered to have special needs, it seems that the barriers that hinder the inclusion of these pupils within mainstream classrooms are the classroom conditions and the need to improve teaching strategy. Abduljabar and Masoud (2002) argue that the most crucial factors in the education of pupils with special needs, relate to the wide range of experiences and opportunities that need to be provided, so that students can practise them in both school and community. This could allow pupils to acquire new patterns of behaviour and experiences that would enable them to grow physically, mentally, socially and emotionally.

In addition, pupils with specific learning difficulties (such as dyslexia), have been fully mainstreamed in inclusive schools, with the aid of specialist teachers who provide an Individual Educational Plan for each student based on their strengths and weaknesses (GASE, 2013). Furthermore, as a consequence of the rise in the proportion of SEN programmes attached to mainstream schools in SA and a belief in changing the role of special schools, the overall percentage of special needs pupils attending and being educated in mainstream schools has increased by up to 80%. As

mentioned, students who live in the countryside or in villages are supported by this changing in educational services (GASE, 2010).

Regarding the curricula which are currently being delivered in SA, the teaching of D/HH pupils has changed from using a special curriculum based on the type and degree of disability, to the mainstream curricula which are delivered to hearing pupils. Wael and Abduljabar argue (2002) that pedagogy is one of the most crucial factors in the education of pupils with special needs. Thus, these pupils' education should be provided on the basis of experiences and activities and include facts, concepts, skills and attitudes that are provided by the school for student use both inside and outside the school.

Moreover, D/HH pupils are being educated by a considerable number of teachers who have graduated from Special Education departments in universities in the country. There are also itinerant teachers and teacher advisors who support the delivery of special education. Under articles 35 and 36 of the GASE regulations, their roles are recognized as follows:

- Itinerant teacher: A teacher specialist in special education who teaches student or more with special educational needs in more than one a mainstream school, so that the teacher travel between those schools.
- Teacher adviser: A teacher specialist in special education and provides advices for teachers of general settings classes who have one or more pupils with special educational needs (GASE, 2010).

Itinerant teachers and teacher advisors provide private lessons to help students with impaired hearing or who have a speech disorder. They also offer advice regarding translating Braille writing for the visually impaired.

This brief overview of the current situation regarding how pupils with deafness and hearing impairments are educated in SA has been presented because of the important

role of education that could be played at this stage of a child's life. One of the objectives of this research study is to determine and understand what factors could have the most beneficial impact upon the D/HH child's education at this stage. Nevertheless, although there are serious attempts aimed at conducting scientific studies in Saudi Arabia in order to identify the impact of the educational environment (integration and special school) on variables such as the academic achievement of students, social skills, adaptive behaviour, and other relevant factors, none of these attempts have yet been implemented (Al-Mosa, 2003). Ashencaen Crabtree and Williams (2013, p. 148) also state that "Inclusive education in the Gulf Cooperation Council (GCC) Arab societies is at a developmental stage with a paucity of research data recording this process". Thus, a systematic review of strategies for supporting these children in the early stages of their life should be undertaken by the educational authorities.

The most critical phases of development for children with special educational needs are the identification, diagnosis, the assessment level of hearing, and early intervention. It is the first step that forms the baseline assessment; this can be a substantial factor that influences the rest of the provision in order to achieve appropriate educational results, such as educational placement. Consequently, many assessment centres have been established across the Kingdom. By carrying out specific tests, these centres assume responsibility for determining the nature and level of difficulty that each pupil faces, before being placed in appropriate educational programmes within mainstream schools.

It appears that the process of measurement and the diagnostic tests available might not be sufficient in terms of their procedures and the preparation and training of

specialised personnel in measurement and diagnosis. Hence, mistakes in the process of diagnosis and judgements are made, resulting in severe and adverse consequences for the children concerned and their families. For instance, placing a child in an educational setting higher than the level of his or her ability, might be as harmful as putting him or her in a place which is lower. As a result, an error in diagnosis can lead to the issuing of a ruling for a child that places him or her at a disadvantage throughout that child's education at school. In the next section, mention will be made of the definition and importance of intervention programmes and services and cochlear implantation in Saudi Arabia and the current services offered to children with deafness and hearing impairment.

1.4 The Current Situation Regarding Cochlear Implantation in Saudi Arabia

A cochlear implant (CI) is a significant surgical intervention for children with deafness. In respect of the management of profoundly deaf children, Archbold and O'Donoghue (2009) state that it would not have been anticipated 10 to 15 years ago, that outcomes could be achieved by cochlear implantation that would be proven to be the most significant change in the management of children with hearing impairment. Moreover, Fitzpatrick and Olds (2015) argue that the number of profoundly deaf pupils educated in classrooms alongside peers with normal hearing, has been increased as a result of the availability of cochlear implants. Therefore, CIs are claimed to be changing education for deaf children and have become a routine treatment worldwide (Archbold and Wheeler, 2010). However, variations in the outcomes of CIs are significant (Geers, 2006). This intervention has also made a challenges towards the measuring of the impact and benefits of the treatment (Marschark, Sarchet, Rhoten & Zupan, 2012).

The current research study explores the benefits of having a CI upon the educational progress and educational placement of deaf pupils in primary schools in SA, and to identify factors that affect the benefits of CI from the experiences and perspectives of parents, teachers and clinicians. It also explores the influence of CI on the pupils themselves in terms of their being included in mainstream schools. Around 1,200 cochlear implant operations are performed annually in SA (Research Chair for Hearing Disability -RCHD, 2012). There is also an expectation of increasingly higher rates of implantation in young children and infants over time (Hyde, Punch & Grimbeek, 2011).

It is crucial to point out that only a few studies have investigated the outcomes of CI in SA and these works have focused on the audiological aspects of this intervention. The current study involved, instead, mainly qualitative research and is the first in SA to investigate the benefits of CI on the daily school life, educational progress and inclusive education of deaf pupils with CIs. Therefore, this study's contribution to the Saudi context will be significant in terms of enhancing the understanding of the current situation regarding the impact of CI upon the educational progress and placement of deaf pupils who are receiving this intervention.

A significant role can be played by the early identification of deafness and early implantation so that positive outcomes of CI can be enhanced. For instance, the influence of CI on the improvement of reading skills in deaf pupils could be enhanced by early implantation and improved technology (Archbold, Harris, , O'Donoghue, Nikolopoulos, White, & Lloyd Richmond, 2008; Geers and Brenner, 2003; Stacey, Fortnum, Barton Summerfield, 2006). A brief overview of the current situation regarding the early intervention programmes provided by different

associations in SA is now presented. Attention will first be given to the kinds of services provided for pre-school children. The situation regarding cochlear implants will then be highlighted, to provide a comprehansive picture of the educational and medical alternatives available. Mention will alaso made of the factors that might affect the outcomes of CI intervention.

There is a notable paucity of research studies focusing on early intervention programmes for SEN in Saudi Arabia. So far, the researcher has only found one study, which was conducted by Aloheeb in 2009. Nevertheless, there are a few articles that highlight the definition of early intervention programmes, their effectiveness and the nature of the programmes involved. Although they might not be considered scientific studies, they provide useful information regarding the current situation of early intervention in Saudi Arabia. The findings of Aloheeb's (2009) study mentioned above are limited to the city of Riyadh, the capital of Saudi Arabia. Although Riyadh is considered the best city in the Kingdom, in terms of the availability of services for the D/HH population and facilities compared to other cities, the study shows that early intervention services are still limited and inadequate.

Aloheeb (2009) claims that specialists teachers (teacher with Special Education degree) agree about the importance of early intervention services for deaf and hard-of-hearing children. The specialists' views on early intervention appear in the following list in descending order of priority: service screening and early identification, family services training, family counselling services, early speech and language therapy services, medical services, early services to provide hearing aids,

early psychological services, early social services, home visit services, and early services for teaching sign language.

Concerning the availability of early intervention services for deaf and hard-of-hearing children, the results of Aloheeb's (2009) findings suggest that the specialists:

- Agreed only regarding the service that provides speech and early language therapy.
- Did not agree on the availability of three services in their order of priority, as follows:
    - Early services providing the teaching of sign language for deaf children over three years old.
    - Services teaching sign language to deaf children from birth to three years old.
    - Services for home visits.
- Agreed to some extent regarding the availability of screening services, early identification, early family training, family counselling services, early psychological, social and medical services, and early hearing aids.

1.4.1 Providers of Cochlear Implant Intervention and Services Offer

Services available for deaf children with CIs are presented in this section. Each of the following three providers is discussed in more detail in section 1.4.2:

- Free services provided by government ministries (Ministries of Education, Health, and Social Affairs);
- Charity associations;
- Private centres (Fees charged).

The kinds of services provided by each of the ministries, associations and centres for children of pre-school age are now outlined.

1.4.2 Free Government Associations (Ministries of Education, Health, and Social Affairs)

1.4.2.1 Ministry of Education - Special Education Service Centres

i) Diagnostic services (audio measurement)

ii) Limited family counselling services

iii) For the early identification of hearing disability, there has been an attempt to provide early education services in regions distant from the services centres. The Ministry of Education launched a project and mobile units for measuring hearing in order to assess the hearing and speech of children who live in remote areas.

1.4.2.2 Ministry of Health - Audio Unit: Units for Communication and Speech Disorders in Hospitals

i) Diagnostic services (audio measurement)

ii) Speech therapy sessions

iii) Cochlear implantation

iv) A programme for the rehabilitation of auditory and verbal behaviour for children who have a cochlear implant. This programme, which was established in 2010, aims at teaching skills that raise the awareness and auditory perception of children and skills that will help them identify different sounds and vocabulary and, ultimately, integrate them via dialogue and communication.

1.4.2.3 Ministry of Social Affairs

This ministry provides hearing aids at no charge.

1.4.3 Charity Associations

i) The provision of educational services and rehabilitation.

ii) Education and community awareness (causes of disability and methods of prevention).

iii) Supporting families coexisting with disabilities and providing them with the means for dealing with them.

1.4.4 Private Centres (Fees charged)

i) Diagnostic services (audio measurement)

ii) Speech and language therapy sessions

1.5 Situation in Saudi Arabia: Services and Difficulties Related to Cochlear Implants

The following outline aims to highlight gaps between the current situation and the ideal provision relating to early intervention for children with deafness and cochlear implants in Saudi Arabia.

As referred to at the beginning of the chapter, around 1,200 cochlear implant operations are performed annually in Saudi Arabia (RCHD, 2014). The percentage of hearing loss in the Kingdom is treble the international average (Sraj Zagzog, cited in RCHD, 2012). However, there is no statistically accurate account of the number of deaf people in Saudi Arabia. There are only estimated numbers of between 300,000 to 500,000, but there is no reliable source that verifies these numbers.

However, research was conducted by the Prince Salman Centre for Disability Research (PSCDR) to create a database documenting the proportion of people with

disabilities and their distribution in the Kingdom (PSCDR, 2012). This involved sponsored, coordinated and funded research and included academic activities. According to the PSCDR (2012, Research Activities page), the research is "committed to establishing reliable disability data because the available data is scarce, inconsistent, and sometimes just plain wrong".

Disability specifically hearing impairment is detected at the age of four or five years and sometimes later than that. Hence, the opportunity to exploit the critical age (the first three years that are critical for child's senses and cognitive development) might be missed. Furthermore, the geographical area might have a significant effect on the quality of the services that are provided to children with cochlear implants. For instance, people who live in the main cities might have access to specialist centres, whereas such expertise might not be available to those living in small towns or cities far from the central medical and rehabilitation centres. Therefore, the place from which research data emanates should be taken into account because of the different capacities of each area and, therefore, it might not be possible to generalise research findings.

According to RCHD (2012), there is a lack of the specialised centres in SA which are needed by children who have cochlear implants and only a limited amount of scientific researches that study CI aspects. Moreover, it is claimed that a negative impact upon CI outcome might be caused by the lack of knowledge demonstrated by parents in terms of the importance of cochlear implants. The high cost of CI surgery is currently estimated at 200,000 Saudi Riyals (more than £33,000) per operation.

The newborn screening that is conducted in developed countries, has enhanced the early identification of deafness and then early intervention by cochlear implantation.

However, this might not be the case in developing countries (Archbold & O'Donoghue, 2009). With regard to SA, a project for the hearing screening of newborns was authorised recently in 2015 (Ministry of Education, 2015). Hence, if disability is detected at the age of four or five and sometimes later, the opportunity to provide early intervention might be needed.

It seems that there is a lack of coordination between the three ministries mentioned earlier (the Ministries of Education, Health, and Social Affairs).Collectively, these ministries provide educational, rehabilitation and social development services for deaf children and those who have hearing problems. In the researcher's experience, there is also very limited provision and support with respect to family counselling, home visit services and other early intervention programmes.

According to the Director of Disability Hearing at the Ministry of Education, an early intervention centre is planned to be established in Riyadh. This centre aims to serve children with special needs, starting from the age of four. However, no regulations have yet been issued for these services. There is also a lack of trained specialists who can manage early intervention programmes. Some mainstream school buildings which provide educational services for D/HH pupils are also of poor quality, which is considered to be a significant challenge faced by the head teachers, staff and pupils at these schools (Al-Braheem, 2003).

1.6 Rationale and Aims of Research

As a specialist in deaf education and as someone who has been engaged in this field for two decades in different roles (as a teacher, head teacher and supervisor) in both special and mainstream schools, it was always my hope to understand and evaluate

the educational benefits of CI from stakeholders' experiences and perceptions. This is particularly important due to the significant number of CI surgical interventions being undertaken in SA. As mentioned, compared with for example, the 650 children who receive implants each year in the UK (British Cochlear Implant Group [BCIG], cited in The Ear Foundation, 2015), given the difference in the population numbers between SA (28 million) and the UK (64 million).

It is claimed that CI is the best currently available treatment for many forms of deafness and that this intervention has a beneficial impact on children and their carers (Archbold & O'Donoghue, 2009a; Huttunen, Rimmanen, Vikman, Virokannas, Sorri, Archbold, & Lutman., 2009; Martin, Lalwani, Waltzman & Waltzman, 2011). However, despite consensus on CI being of benefit to deaf children, there is no clear definition of the concept of successful CI treatment (Richter, Eißele, Laszig, & Löhle, 2002). Moreover, there are variations in the outcomes of this treatment and difficulties in identifying pre-implant predictors of outcomes (Pisoni, Conway, Kronenberger, Horn, Karpicke & Henning, 2008).

CI intervention has provoked significant disagreement amongst those who regard this treatment as an experiment lacking certain demonstrable outcomes (Archbold & O'Donoghue, 2009a). This premise is associated with the Deaf culture, which views deafness in terms of logistical and social differences, rather than as a medical issue (Kermit, 2009). Further discussion regarding the deaf culture is presented in the following literature review chapter. Thus, introducing a CI might be expected the idea of having either a hearing and speaking son/daughter or one who is Deaf who uses sign language. However, a distinction should be made between the ability to

hear and the ability to read and interact effectively with others, by using either oral or sign language (Kermit, 2010).

As presented earlier regarding the availability and benefits of an intervention such as CI becoming a routine treatment worldwide (Geers, 2006), deaf pupils in SA, as in many countries in the world, have been performing in school but requiring and needing CI to be enabled educationally, socially and psychologically. Therefore, the rationale for this study lies in understanding the current status of the educational progress and the inclusive education of deaf pupils who have undergone CI management in primary schools in SA. The need to seek greater knowledge of these phenomena is also considered. The focus in this study is presented in light of the following overall aims, which are then reflected in the research questions:

1. To explore the perceptions and expectations of parents prior to deciding whether or not have CI surgery for their child, which could shape the decision-making process.

2. To explore post-CI surgery experiences of the educational progress of pupils with this treatment, and the advantages and disadvantages of CI from the experiences of parents, teachers and clinicians. The academic performance of pupils with CIs will also be highlighted by the experiences of both parents' and teachers' experiences. The differences between these pupils' academic attainments and deaf students without CIs will also be highlighted. Factors that affect the outcomes of CI will be discussed.

3. To explore the impact of CIs upon the educational placement of pupils with this type of management based on exploring the current situation of these students' educational settings and from the perceptions and experiences of parents and

teachers. The role of environment, which could affect the educational placement of these students, will also be discussed.

1.7 Research Questions

This study aims to explore the benefits of cochlear implants surgery upon the educational progress and inclusive education of deaf pupils in primary school in Riyadh. In order to fulfil this aim, the following research questions were formulated for the study.

Research Question 1:

What is the parental decision-making process regarding whether to have a CI for their deaf child?

1a. what are the perceptions and expectations of parents prior to deciding to have/not to have CI surgery for their child?

Research Question 2:

What are the benefits of CIs for the educational progress of deaf pupils in primary school in SA?

2a. what are the post-CI surgery experiences of parents, teachers and clinicians regarding the benefit of CIs for the educational progress of deaf pupils with CIs?

2b. what are the differences between deaf pupils with/without cochlear implants in their educational progress based on school academic results?

2c. what are the participants' perceptions and experiences regarding factors affecting the educational progress of deaf pupils with CIs?

Research Question 3:

To what extent does CI surgery affect educational placement of deaf pupils at primary schools in SA?

3a. what are the current types of educational settings of pupils who have CIs in primary schools in Riyadh?

3b. what are the participants' experiences regarding the impact of CIs on enhancing inclusive education for deaf pupils with CIs?

3c. what are the perceptions and experiences regarding the role of the educational environment upon the inclusive education of deaf pupils with CIs?

1.8 Structure of Thesis

The chapters of this research thesis are organised as follows.

Chapter 1

The first chapter provides an introduction to the research study. The background to the study is explained followed by details of the research aims, the research questions and structure of the thesis.

Chapter 2

In the second chapter, literature related to the research topic is discussed in detail. The theoretical aspects of cochlear implants, and a range of issues pertaining to hearing impairment, are discussed in greater depth.

Chapter 3

Methodology is said to be one of the most important parts of any research study. This chapter explains how the research was conducted and what methods and tools were used to collect the data.

Chapter 4

In this chapter, pilot study was undertaken to examine the findings of the data that were collected by this pilot study within the context of the research objectives.

Chapter 5

In this chapter, the findings are reported according to the research questions.

Chapter 6

This is the discussion chapter. The findings are discussed in the light of relevant literature and the research questions.

Chapter 7

This chapter is divided into two parts: firstly, recommendations are made based on the findings and, secondly, conclusions are drawn.

Chapter 2: Literature Review

2.1 Introduction

This chapter reviews literature focusing upon the benefit of CI surgery for deaf pupils educational progress and inclusive education. Researching the literature involved examining studies relating to the definition of deafness and its impact upon child development, educational implications and inclusive education. The nature of cochlear implant (CI) treatment and factors affecting the outcomes of children with cochlear implants are also discussed in this chapter. Reflections on some of these studies and a consideration of the limitations of the reviewed literature are also highlighted. A wide range of sources was consulted in conducting the literature review, including online electronic journals and databases, such as EBSCO, Education Research Complete and SEDL, were accessed for this literature review.

This chapter is structured as follows: first, deafness and hearing impairment in the light of definition of terms, classifications, causes of deafness and the functions of hearing will be highlighted. Second, the impact of hearing loss upon child development will be discussed. Then, a consideration of the educational implications of hearing impairment, definitions, overview and differences between special needs placements and support services for deaf pupils are presented. The treatment and management of hearing impairment in children will be also addressed. Finally, cochlear implant treatment and factors affecting outcomes for children with CI will be discussed.

2.2 Deafness and Hearing Impairment

2.2.1 Definition of Terms

According to Werngren-Elgstrom et al. (2003), about one child per 1,000 of the total world population is deaf or suffers from a hearing impairment. It is argued that the definition of deafness and hard of hearing (D/HH) is considered a controversial issue for both parents and scholars. Different definitions of deafness exist, such as Deaf culture, in which being deaf is seen as an identity not disability, and special needs that are provided by studies either through an educational, academic, medical or legal viewpoint or from a social perspective (Devlieger, 2005). An explanation of this is that such definitions focus on different points of view regarding what are considered to be special needs. Hence, the various definitions have created a substantial variation in policy, research and practice (Wilson, 2000).

People who are defined as "deaf" are those who are completely or partly without hearing ability (Jones, 1995). It is important to point out that although the terms "hearing impairment" and "hearing loss" are frequently used interchangeably to describe a range of hearing losses, including deafness, the US Individuals with Disabilities Education Act (IDEA, 2004) essentially defines the terms "Hearing impairment" and "Deafness" separately under Regulation Part 300/A/300.8/c/3 as follows:

- Hearing impairment is an "impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance" (p. 9).
- Deafness means "a hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification that adversely affects a child's educational performance" (p. 9).

Guthmann and Graham (2005) argue that there are two common but different perspectives when considering deafness. First, the medical model, which recognises deafness as a disability; second, a cultural model, which identifies deaf people as individuals with values, experiences and a common language. Conflicts can arise between these two models, and need to be addressed by service providers, as both perspectives offer different views of the D/deaf population (Guthmann & Graham, 2005). Skelton and Valentine (2003), however, draw a distinction between Deaf and deaf children. The former term is associated with the medical interpretation of Deafness seen as disability or deficit. In this context, Jones (1995) has also defined the "Deaf" as individuals who are completely or partly without hearing ability. Type, degree and audiometric configuration are also used as bases for defining hearing loss (Ardle and Glindzicz, 2010).

Ladd (2003 p. xviii) argues that

> 'Deaf refers to those both born Deaf or deafened in early (sometimes late) childhood, for whom the sign language, communication and culture of the Deaf collectively represent their primary experience and allegiance, many of whom perceive their experience as essentially akin to that of other language minorities'.

Hence, the deaf linguistic cultural minority point of view considers sign language as the first means of communication. Such a perspective is compatible with the cultural model, which indicates that the members of the Deaf community should be described without using the term "disabled". Rather, such members believe that they fit into a distinct minority language community. Lane (2002 p. 367) states that:

> …according to my deaf informants, "deaf" means "like me"—one of us—in significant cultural ways. A deaf person values being deaf and possesses other attitudes, values, morals, and knowledge that are particular to that culture. Thus, something positive lies at the core of the meaning of "deaf", and there is no implication of loss.

With respect to the cultural model, subscribing to the disability definition might be considered a dilemma, involving gaining rights and accessing government services, public events and education (Lane, 2002). In contrast, those who lost some or all of their hearing in early or later life are primarily described as “deaf”, using a lower-case “d”. They usually also wish to avoid making contact with signing Deaf communities, as a consequence of preferring to be members of the majority society with which they were socialised (Ladd, 2003). Having said this, Senghas and Monaghan (2002) claim that an overlap between the implications of these terminologies (D/deafness) may exist, demonstrating the complexity of these concepts.

2.2.2 Classifications and Causes of Deafness and Hearing Impairment

In this subsection, causes which might lead to hearing loss are presented and types of deafness discussed. Classifications and types of deafness are also highlighted. Moreover, comparison is made between these causes in developed and developing countries, including Saudi Arabia, are highlighted in order to understand the current situation of deaf people. The question as to whether preventing deafness might be possible depending on the nature of the cause is also considered.

Hearing loss is attributed to many causes. Burkey (2006) claims that there are preventable, treatable and non-avoidable causes of hearing loss, but that even the last cause (non-avoidable causes of hearing loss) could be surmountable and the impact of such loss minimised. Noise exposure, smoking, high blood pressure, diabetes, and toxic medication and substances are considered preventable causes of deafness. Whereas, treatable causes include a build-up of earwax, infection, a perforated

eardrum, ossicular damage, cholesteatoma, otoseclerosis and autoimmune inner ear disease. With respect to the surmountable causes, despite the possibility of involving medical treatment to improve hearing loss, most sensorineural losses cannot be reversed and are not medically treatable. However, they are surmountable through appropriate management (Burke, 2006). Aging, heredity and unknown aetiology are identified as causes of permanent hearing loss.

The World Health Organisation (WHO, 2013) also divides the possible reasons for hearing loss and deafness into congenital and acquired causes. Congenital explanations might cause hearing loss either in the present or acquired soon after birth, and could have hereditary and non-hereditary genetic factors or be caused by specific difficulties during pregnancy and childbirth. In respect to acquired causes, such as infectious diseases, the hearing loss could occur at any age. In addition, there are a number of medical aspects that have been identified as causes of hearing impairment, such as head trauma and autoimmune inner ear disease (AIED) (Hearing Loss Association of America [HLAA], 2013).

According to the World Bank (Worldbank, 2015), Saudi Arabia has one of the highest annual population growth rates (1.9%). The hearing impairment rate in this country is also high compared with the global rate, particularly in children under the age of eight. The percentage of hearing loss in SA of 13% is ten times the international average (Sraj Zagzog, as cited in RCHD, 2012). However, in Saudi Arabia, there is no statistically accurate account of deaf people, although research has been conducted by the King Salman Centre for Disability Research (KSCDR) to create a database documenting the proportion of people with disabilities and their distribution in the Kingdom (PSCDR, 2012).

Having reviewed the most common causes of hearing loss, it appears that the majority of cases of the onset of hearing loss since birth might be related to congenital (genetic) causes. Alseh (2014) argues that 50% of hearing-impaired children in SA have such impairments as a result of genetic causes. This high percentage of genetic causes might be a result of intermarriage (between relatives, first cousins in particular), which is considered part of the cultural background of the country (Almanal, 2015). However, the gathering of accurate and up-to-date statistics still needs to be undertaken.

Looking at a similar country in the same region as SA, a national survey was conducted to estimate the popularity and causes of hearing loss in Egypt, another Arab country. From the survey, one can note the following:

> From six randomly selected governorates (Alexandria, Dakahlia, Luxor, Marsa Matrouh, Minia and North Sinai), 4000 individuals were screened for hearing loss. The prevalence of hearing loss was 16.0% with no significant sex differences. There were significant differences between the age groups and governorates: Marsa Matrouh had the highest prevalence of hearing loss (25.7%) and North Sinai the lowest (13.5%); those > 65 years had the highest prevalence (49.3%), but it was also high among those aged 0-4 years (22.4%). Otitis media with effusion (30.8%) was the commonest cause of hearing loss, followed by presbycusis (22.7%) (Abdel-Hamid; Khatib; Aly, Morad & Kamel, 2007, p. 1170).

According to the PSCDR (2012), a comparison was made between SA and other countries regarding the number and severity of disease-causing disabilities in newborn babies. Initial statistics showed that the number of cases in SA was 1:700 births compared to 1:4,000 in America, Australia and Germany, and 1:7,000 in Japan. From these statistics, it can be seen that a significant incidence of disability exists in developed countries compared with developing countries.

Deafness is generally classified by the timing of its onset, degree and type. Also, congenital and acquired deafness are recognised as classifications of deafness. Saeed, Booth and Hill (2009) state that congenital deafness is present at birth, whilst acquired deafness is a result of events during infancy or childhood and adulthood. The aetiology of deafness needs to be investigated accurately for both hearing impairment and vestibular function (inner ear), as there are variations when diagnosing the different kinds of deafness (Ardle & Glindzicz, 2010).

Regarding the degree of hearing loss, it is important to point out that sound is measured by "its loudness or intensity (measured in units called decibels, dB); and its frequency or pitch is measured in units called (hertz, Hz)" (National Dissemination Centre for Children with Disabilities [NICHCY], FS3, 2010). According to the degree classification, hearing-loss types are Slight, Moderate, Severe, or Profound. These levels depend on how well certain intensities or frequencies can be heard most strongly by the individual. Impairment in hearing may occur in only one ear or in both (unilateral or bilateral hearing loss respectively). Generally, children are considered deaf if their hearing loss is greater than 90 dB. Therefore, measuring hearing loss by decibel should be considered a significant stage in defining a child as deaf or having a hearing difficulty (Skelton & Valentine, 2003). However, in SA, according to Regulations for Special Education Programmes issued by the Ministry of Education, a deaf pupil is a child who has a hearing loss of 70 dB and above (Ministry of Education, 2015). Thus, there is difference in what is considered hearing to be loss between different countries.

In respect to types of hearing loss, there are three types of hearing loss according in which part of auditory system is damaged as follows:

- Conductive hearing loss: when hearing loss is due to problems with the ear canal, ear drum, or middle ear and its little bones.
- Sensorineural hearing loss (SNHL): when hearing loss is due to problems of the inner ear, also known as nerve-related hearing loss.
- Mixed hearing loss: refers to a combination of conductive and SNHL. This means that there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve (HLAA, 2013). Breege and Glindzicz (2010, p. 14) also state that "permanent hearing loss in children can be conductive, sensorineural or a mixture of both and the degree of hearing loss is described as mild, moderate, severe and profound".

2.3 Functions of Hearing

As focus of this thesis on deaf children, functions of hearing and the nature of this sense are highlighted in this section. The two main functions of the ear are hearing and balance (Action on Hearing Loss [formerly the Royal National Institute for Deaf People, RNID], 2012; Wright, 2009). A significant part of communication is formed by the ears. Potentially threatening environmental sounds are also detected and located by hearing (Wright, 2009). Different aspects of life require hearing. However, even if the functioning of a person's ear was not impaired, hearing ability should not be taken for granted. Importantly, it is argued that hearing can be adversely affected by environmental factors. Furthermore, the sensitive and rapid processing of acoustic energy that the normal inner ear provides and which are required for speech communication, is considered a significant function of the human

communication on which we rely (Brownell, 2010). Applera and Goodrich (2011, p. 488), eloquently describe the complexity of auditory processing, (making sense of sounds):

> Auditory processing begins in the cochlea of the inner ear, where sounds are detected by sensory hair cells and then transmitted to the central nervous system by spiral ganglion neurons, which faithfully preserve the frequency, intensity, and timing of each stimulus. During the assembly of auditory circuits, spiral ganglion neurons establish precise connections that link hair cells in the cochlea to target neurons in the auditory brainstem, develop specific firing properties, and elaborate unusual synapses both in the periphery and in the CNS. Understanding how spiral ganglion neurons acquire these unique properties is a key goal in auditory neuroscience, as these neurons represent the sole input of auditory information to the brain

An active hearing process is one that amplifies and tunes the movements of the ear's sensory receptors; the hair cells enhance the sensitivity of human hearing. The spontaneous emission of sounds from an ear can even be evoked in a quiet environment by the active process (Hudspeth, 2005). The human ear can be described as an efficient structure. A collection of sounds from the outside world is sent to the brain; this process is performed by many individual parts interacting in harmony (Burkey, 2006). The ability to sense, to perceive and to respond to complex sounds in our environment, from music and language to simple warning signals, depends precisely on organised circuits. The structure of the ear can be seen in Figure 1.

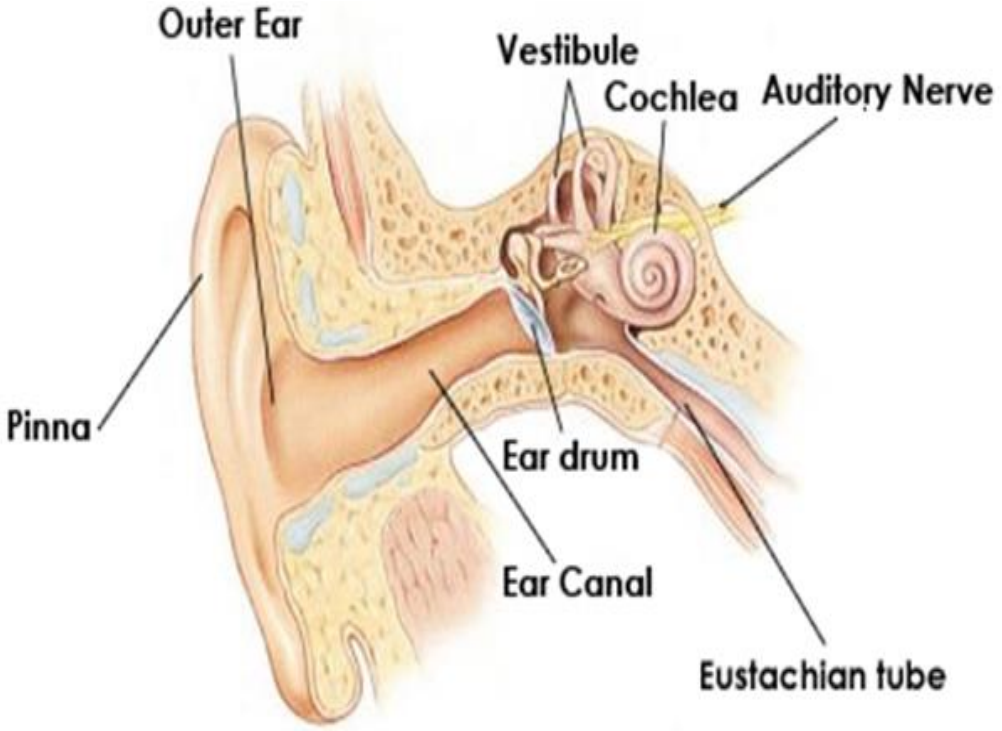

Figure 1: The structure of the ear (science.howstuffworks.com, 2012, p. 2)

Sound waves are collected and channelled to the eardrum by the outer ear. Vibration and sending the sound via the middle ear to the cochlea in the inner ear are made by the eardrum. Then, thousands of tiny sensitive cells called hair cells in the inner ear pick the sound. Information about the sound is sent by such hair cells to the brain (HLAA, 2012). Knight (2009) states that sounds can be classified as periodic and aperiodic. The unit of measure for the frequency of sounds, that is, how often a sound repeats per second, is the hertz (Hz), whereas the pitch of a sound is the psychological correlate of such a frequency.

2.4 Impact of Hearing Loss upon Child Development

This section highlights the impact of hearing loss upon child development and the implications that might affect the family as a consequence of such loss. Social and emotional, behavioural and cognitive dimensions are discussed in turn. The

following section then presents a consideration of the educational implications of hearing loss.

Social, Emotional and Independence Implications

Relationships, work, leisure, safety, and security can be significantly affected, not only by deafness but also by hearing impairment. Burkey (2006) argues that implications of hearing impairment are determined by social science studies and personal narratives. Hearing loss could also have a negative impact that is more notable than any other physical disability combined with inadequate communications skills (McKenna and O'Sullivan, 2009). Burkey (2006) claims that hearing impairment can often reduce independence as a result of communication difficulty and feelings of exclusion and isolation.

It is now claimed that communication skills are more important to the workforce than physical abilities (McKenna & O'Sullivan, 2009). The treatment of people with hearing impairment in a workforce environment is one of the challenges that could affect these people. Although the effects of hearing loss can be mitigated by 50% as a result of using hearing aids, Kochkin (2007) conducted a survey of more than 40,000 households utilising the National Family Opinion survey panel in the US. The findings showed a negative impact upon the average families' income up to $12,000 annually, depending on the level of hearing impairments of the incumbents. In addition, it has been stated that the likelihood of a workforce excluding people with a hearing impairment is eight times higher compared with others who do not have such impairment (McKenna & O'Sullivan, 2009). So, hearing impairment has far-reaching implications in terms of employment prospects.

With respect to psychological implications of deafness, there are different factors that might influence a deaf pupil's experience of friendship, personality and socialisation. Cambra (2002) argues that the formation of the self-concept could be affected by two main groups of factors. Firstly, explicit variables, such as deafness itself and the implications that might arise as a consequence, such as difficulty making lasting friendships; secondly, implicit variables, such as issues related to educational settings, degree of disability, and acceptance by parents, relatives, peers, teachers and the local community. Furthermore, according to Backenroth (1986, pp. 124-131), "The most important problems that have confronted deaf persons over the years have not been the hearing impairment as such but rather the lack of understanding on the part of their surroundings as to what deafness implies". Also, Harter (1992) states that feeling frustration, anxious or ashamed about parents' negative response over academic failure could harm child's self-perception.

Gill and Feinstein (1994, as cited in Burkey, 2006) conclude that quality of life is a multifaceted personal perception that must be measured from an individual's point of view. However, it is suggested that the impact of hearing impairment on an individual's life could be measured effectively by exploring the concept of quality of life. It appears that medical concept such as the function of the ear is a dominating approach in terms of measuring such impact. In addition, Burkey (2006) argues that confusion could result from exploring quality of life as an individual measure of status, while using this concept interchangeably with the concept of function which is an independent measure. Such confusion might exist even in identifying variables which could influence educational outcomes.

Kramer, Kapteyn, Kuik and Deeg (2002) have conducted research on a sample consisting of 3,107 hearing impaired adults and pointed out that:

> The hearing impaired elderly reported significantly more depressive symptoms, lower self-efficacy and mastery, more feelings of loneliness, and a smaller social network than that of normally hearing peers. Whereas chronic diseases demonstrate significant associations with some outcomes; hearing impairment is significantly associated with all psychosocial variables (p. 122).

Nevertheless, it is claimed that methodological procedures might lead to conflicting findings that occur in studies linking hearing impairment with difficulties, such as depression or anxiety. This is either because of possible confounding variables that have not been taken into account or limitations in the participants, who have a hearing impairment and were involved in these studies (McKenna & O'Sullivan, 2009).

Dalton, Cruickshanks , Klein , Klein , Wiley & Nondahl (2003) state that in their research "severity of hearing loss was significantly associated with having a hearing handicap and with self-reported communication difficulties" (p. 663). Personal relationships within the family, work environment and social networks could be affected by difficulty in joining in conversations. In addition, experiences of feeling left out and everyday non-verbal sounds, such as doorbells, music and traffic, cannot be perceived consciously by deaf people (Graham, Baguley & Ballantyne, 2009).

The life of the parents of deaf children could be substantially affected regarding the inability to solve problems, communicate cooperatively and perhaps the difficulty of having an effective relationship with extended family members (Park, Hoffman, Marquis, Turnbull, Poston, & Mannan, 2003). An illustration of this in the Saudi context is that the relationship with the extended family is considered a core issue in community culture, which has a significant impact on a child and/or his/her parents.

It is claimed that the presence of a disabled child has a significant impact on family relations, and that this often represents a disappointment to the aspirations of the

parents and leads to profound variations in expectations (Qandial, 2000). The implications of deafness might also have a negative impact on the relationships with extended family members. Therefore, enhancing the child's preferred communication mode could influence the degree of ease of interacting with extended family members (Jackson & Turnbull, 2004).

The growth of a child's social and emotional development including the ability to adapt to the family could be hindered by a hearing disability, which might also lead to a lack of adequate response to social, linguistic and audio stimuli (Hughes, 1998). The relationships between families and those of their children with severe hearing loss can often face significant challenges compared with those with children who have mild or lesser degrees of hearing impairment (Hintermair, 2000). Understanding spoken language cannot be achieved without effort, although a hearing-impaired person might accomplish this by focusing on effective strategies, for example, thinking and trying to identify what is said to him/her (Burkey, 2006).

Guthmann and Vicki (2004) claim that an absence of experience and knowledge with respect to treating the D/deaf and people with hearing impairment, is a major obstacle that could prevent these people receiving the support they need. Bodner and Johnson (2001) argue that uncertainty might occur as a result of a lack of parents' knowledge in terms of teaching children with deafness. Therefore, the many potential difficulties associated with interaction and communication that is caused by deafness might have a substantial effect on all aspects of an individual's life.

Although deafness does not usually affect an individual's physical mobility, deaf people's ability to function independently might still be limited. It is claimed that deafness and hearing impairment can lead to depression (Heine & Browning, 2002).

Burkey (2006) argues that depression can result in reduced enjoyment of social situations, feelings of isolation, loneliness, reduced confidence, anxiety, stress, and tiredness. However, it is possible that CI intervention can remove these obstacles to well-being to some extent, such as enjoyment of school and enjoying rewarding friendships.

Behavioural Implications

Relationships between language, attention, and child behaviour problems have been found to be significant. In the context of executive functioning and communicative competence, a study conducted by Hintermair (2013) discussed the behavioural problems of deaf and hard-of-hearing school-aged children. A significant developed problem regarding the degree of executive functions was shown in the deaf and hearing-impaired pupils compared with a normative sample of hearing children.

Behavioural problems in young children might emerge from the lack of language and communication (Barker et al., 2009). Thus, the role of development of language and communication should not be excluded in predicting and assessing such problems (Barker et al., 2009). For instance, Van Gent, Goedhart and Treffers (2011, p. 720) have highlighted "the importance of considering self-concept dimensions, peer problems and deafness- and context-related characteristics when assessing and treating deaf adolescents".

Measurements of performance in a study (Barker et al., 2009) of 116 profoundly deaf and 69 normally hearing children aged 1.5 to 5 years also showed greater difficulties in terms of behaviour, attention, language and less than hearing children in time spent communicating with their parents. Furthermore, self-segregation attitudes to network with those of similar hearing status are also displayed by hearing-loss

groups (Shiff & Hoffman, 2011). Nevertheless, Martin, Bat-Chava, Lalwani and Waltzman (2011) argue that hearing-impaired children networking in one-to-one situations have shown better outcomes, and girls display better performance than boys.

There is evidence that change in family roles and expectations, and the accompanying emotional reactions to the loss of hopes and aspirations associated with the birth of a child as a result of the child's disability (Calderon & Greenberg, 1999). This situation might also lead to great pressure on both parents and child, resulting in behavioural problems. From an Arabic-country perspective, Algaruty (2006, p. 311) has argued that ''The hearing disability affects growth of child's socialisation and his/her involvements and interactions with others and integration into the community''.

Cognitive Implications

Reduced cognitive abilities may also be an issue associated with hearing impairment. Arlinger (2003) states that many studies have found a correlation between hearing impairment and reduced cognitive function. It is argued that hearing people view deafness at birth as a disability that affects cognitive, social, and intellectual development and causes substantial sensory impairment (Pisoni et al., 2008). However, it is critical to point out, not only that hearing and auditory processing might be related specifically to deafness and difficulty of language, but also that the processes of cognitive control, self-regulation and organisation, which are neurocognitive systems, display disturbances (Pisoni et al., 2008). Also, it argued that such correlations are challenged to be distinguished and determined in terms of whether reduced cognitive abilities occur because of or alongside hearing

impairment. This might lead to the perspective that the difficulty of language is not only related to hearing impairment but also to the neurocognitive systems that show disturbances.

Jerker (2003) has claimed that important general predictions and applications can be derived by neurocognitive data such as the long-term memory, storage capability, feature of phonology and overall processing for both spoken- and signed-language conditions. A working-memory framework could also be involved as a cognitive contribution in understanding both speech and sign languages (Jerker, 2003). Therefore, such cognitive abilities have to be supported and enhanced.

Interaction effectively between parents and their deaf child can play an important role in support and enhance cognitive abilities. Not only could the development of perception, attention and memory be enhanced by parents and family members who interact effectively with their deaf child, but a wide scale of sensory-motor coordination, visual-spatial processing that are different process of neurocognitive might also be enhanced (Pisoni et al., 2008). It has also been stated that influences upon improvements in both literacy skills and language could be provided by interactions in concept-related language and cognitive processes between deaf pupils (Marschark, 2003).

From the arguments discussed above, it can be seen that deafness can exert a significant impact upon both child and family in all different aspects of life. Therefore, the necessary intervention and treatments should be delivered and all possible solutions have to be taken into account. Intervention treatment and management needs to take a holistic view of child's life. Before possible treatments

and solutions are highlighted, the following section focuses on the educational implications of hearing loss and the background of inclusive education.

2.5 Educational Implications of Hearing Impairment

In this section, a consideration of the educational implications of hearing impairment will be undertaken.

2.5.1 Impact of Hearing Loss upon Educational Progress

Marschark (2003) and Marschark and Knoors (2012) argue that lagging behind hearing peers in terms of academic achievement is a common experience for deaf pupils throughout their learning at school. As mentioned earlier, deaf students are those who are born deaf or become deaf in early childhood so that their language is adversely affected by deafness. The greatest issue regarding the educational outcome is that understanding fluent spoken communication in all or many interaction situations may be difficult for deaf students.

Using sign language as a main means of communication is referred to as a characteristic of deaf people, while hearing-impaired people can acquire some speech. Therefore, accurate diagnosis might play a significant role in determining an Individual's Educational Plan (IEP) so that this plan can be designed according to the hearing level. Measuring hearing loss by decibel (dB scores) should be considered as a significant procedure stage in defining whether a child is deaf or whether s/he has a hearing difficulty (Skelton & Valentine, 2003). Moreover, the degree of hearing loss could affect a child's education and the educational setting that would be suitable for his/her needs.

One of the main considerations in designing for a pupil's learning and educational placement is the development and quality of the child's functional communication. Whether it is by spoken or signed language, frequent and consistent is a significant tool for language development (Marschark, 2001). Having a language problem and delay in acquisition is often associated with hearing impairment (Doherty, 2011), so it is critical to help the child build communication and language skills using his/her available abilities in the early stages of child's age (Centers for Disease Control and Prevention (CDC) , 2013). Catts, Fey, Tomblin, and Zhang (2002) argue that ''Reading is a language-based skill, and thus, deficits in language development can negatively affect reading achievement'' (p1142).

It has been claimed that the basis of human social interaction is language, as it is influenced by experience and develops over time. To further illustrate the distinction between language and communication, a word, whether it is written or spoken, is represented by language, whereas communication is all about the message. It is also claimed that "Communication is about sharing ideas, facts, thoughts, and other important information. Language can be used to share this information either by speaking or signing" (CDC, 3013, p. 6).

The US Department of Education has addressed the active role that language and communication is playing in the educational process of children who are deaf or have hearing difficulty:

> The major barriers to learning associated with deafness relate to language and communication, which, in turn, profoundly affect most aspects of the educational process. The communication nature of disability is inherently isolating, with a considerable effect on the interaction with peers and teachers that make up the educational process. This interaction, for the purpose of transmitting knowledge and developing a child's self-esteem and identity, is dependent upon direct communication. Yet, communication is the area that is most hampered between a deaf child

> and his or her hearing peers and teachers (Education Department (ED), 1992, 57 Fed. Reg. 49274)

However, barriers to deaf and hearing-impaired students' learning in the classroom might not be related or limited to communication (Swanwick & Marschark, 2010). They point to other aspects, such as the school, teachers and school administrations that might affect educational outcomes and thus should be taken into account.

It should be noted that a supportive educational environment and the inclusion of a hearing-impaired child will play a significant role in enhancing his/her communication and learning at an inclusive school. Therefore, ideally these students should study in an inclusive educational environment, since this has a positive impact on their psychology aspects, personality and sociability. Pupils who have a hearing impairment should be included within mainstream schools and be educated without exclusion or marginalisation. Hence, hearing-impaired pupils need to be cared for personally and socially in order to be able to cope with their learning, since marginalisation might hinder their inclusion (Messiou, 2011).

2.5.2 Definitions, Overview and Differences between Special Needs Placements

The principle of special education was established in the Western world during the last century to meet the humanitarian and moral needs of all students (James & Cherry, 2010). This concept has been evolving and changing in terms of content and form and has led to the development of the concept of inclusion, the term 'inclusion' explicitly refers to the elimination of any type of discrimination or exclusion of any kind of needs in the school environment. A brief discussion of the evolution of special education towards inclusion is highlighted here, as well as the different varieties of educational setting, such as special, integrated and inclusive education

and mainstreaming for the various groups of deaf pupils. The differences between these educational placements is also investigated.

It is often pointed out that there is a difference between the meaning of the term "special needs" from a linguistic point of view and in the criteria of application, that is, what is considered as special needs. This terminology continues to create substantial variation with respect to policy, research and practice (Wilson, 2002). Many policies describe or define Special Educational Needs (SEN) based on intensity, thus the labelling of disability is made in terms of "severe", "moderate" and "mild". However, Vehmas (2008) wonders "whether sorting needs into ordinary and special is discriminatory" (p. 87). In addition, according to Hornby and Kidd (2001), avoiding certain categories should be implemented by legislation, in order to enhance specialists and researchers in learning, communication, social skills and sensory and physical that is four comprehensive aspects of SEN.

The significant impact of the different definitions has led researchers to elaborate upon the concept of SEN towards inclusive education. For instance, special needs might be exhibited by students who come from minority groups or social communities whose backgrounds differ from those of the majority of the school population. As a consequence, many children have not had the opportunity to learn in the mainstream school educational system, due to exclusion and have received different forms of special provision. However, there was a dramatic development in the concept of education as well as the challenge to apply such concepts throughout the world. The inclusion concept of education for all was the positive outcome of this challenge. In UK 1978, Warnock report remarkably created inquiry into Education Handicapped Children and become a framework of provision in learning students with disabilities (Warnock and Norwich, 2010).

The aspiration of inclusive education is to remove social exclusion that is a result of discriminatory attitudes to diversity in social class, gender, ability, religion, race and ethnicity (Ainscow & Cesar, 2006). This concept was supported by the Salamanca World Conference on Special Needs Education (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 1994). Inclusion could reduce the negativity relating to exclusion that is caused by segregated educational forms, as special schools or special classrooms at schools might represent the exclusion of students who are educated at these types of educational settings.

Exclusion is defined as removing a pupil from school to comply with school rules (Booth & Ainscow, 2002). Exclusion from mainstream education is applicable because students have a disability or impairments that cause learning difficulties (Booth & Ainscow, 2002). However, exclusion also refers to being withdrawn from a school for usually disruptive behaviour (Nash, Schlösser and Scarr, 2015). Moreover, criticism of the special education approach was made in order to change and restructure the education of pupils with disabilities (Osgood, 2005).

Educating children with disabilities in mainstream schools is considered in some countries as an inclusive education approach (Ainscow, 2005; Farrell, Tweddle & Malki, 1999). Whereas, worldwide, supporting and embracing diversity amongst all students have been adapted (Ainscow, 2005; UNESCO, 2001, as cited in Booth & Ainscow, 2002). In this context, Mittler (2005) also argues that inclusive education could be defined as reforming and restructuring schools as a whole to ensure access for the whole diversity of learners.

The move towards inclusive education could mean focusing on supporting the involvement and learning for pupils' diversity (Ainscow, 2005). However, the

Salamanca Statement (1994) referred to above places emphasis upon, not just access to, but also the quality of education. It is suggested that it is essential that schools are developed, rather than only including efforts to integrate pupils with special needs into schools (Ainscow, 2005).

The terms "inclusive education" and "mainstreaming" are often used interchangeably but there are, in fact, fundamentally differences between them. Lindsay (2007) uses these terms together and indicates that inclusive education/mainstreaming is considered a key policy objective in educating children with SEN and disabilities. Therefore, Stinson and Antia (1999) state that inclusion and mainstreaming represent practices within a dimension, where the outcome of such practices is "integration". Furthermore, in UK, a school that is not special or independent is defined as a mainstream school (UK Department for Education and Skills [DfES], 2001). For the purposes of this theses, the following definitions are:

> Mainstreaming is the integration of children with disabilities with their peers in general education based on individual assessment, whereas inclusion is "Inclusion" goes beyond mainstreaming in that it implies that most children with disabilities will be educated in the general education classroom for most, if not all, of the school day (Hocutt, 1996, p. 79).

However, a clear working definition of inclusion might be elusive (Florian, 2014), because these continues to be widespread debate are the precise meaning of this term. Defining inclusion is faced by conceptual difficulties that continue unanswered (Hegarty, 2001, as cited in Florian, 2014).

Stinson & Antia (1999) discuss inclusion from three perspectives: placement, philosophy and pragmatism. The placement perspective represents the physical settings, so that inclusion indicates that students will be included for the whole of the school day within regular classrooms, while mainstreaming means that students will

be educated within mainstream schools but not necessarily within regular classrooms. With respect to the perspectives of philosophy and pragmatism, inclusion in the former implies that mainstream classrooms should be adapted to the student, not the opposite, and in the latter inclusion refers to the partnership that should be made between mainstream teachers and special educators in order to accommodate the classroom for SEN. In this context, Ainscow (2006) argues that practice, culture and policies can be values that enhance inclusion. These values might be linked to the previous perspectives mentioned as strategies for implementing inclusive education.

Doherty (2011, p. 792) states that "inclusion can emphasise a location, a shared system of values or attitude". Definitions of inclusion in education from the Index for Inclusion (Booth & Ainscow, 2002 p. 3) involve:

- Valuing all students and staff equally.
- Increasing the participation of students in, and reducing their exclusion from, the cultures, curricula and communities of local schools.
- Restructuring the cultures, policies and practices in schools so that they respond to the diversity of students in the locality.
- Reducing barriers to learning and participation for all students, not only those with impairments or those who are categorised as "having special educational needs".
- Learning from attempts to overcome barriers to the access and participation of particular students to make changes for the benefit of students more widely.
- Viewing the difference between students as resources to support learning, rather than as problems to be overcome.
- Acknowledging the right of students to an education in their locality.
- Improving schools for staff as well as for students.
- Emphasising the role of schools in building community and developing values, as well as in increasing achievement.
- Fostering mutually sustaining relationships between schools and communities.
- Recognising that inclusion in education is one aspect of inclusion in society.

Unlike the UK, schools in SA do not have a school policy on inclusive education. In order to enhance the success and effectiveness of inclusion in schools, different requirements need to be considered to implement whole school ethos. Changing attitudes, developing professional skills and collaborating within ongoing partnerships are suggested as keys issues for successful school inclusion (Forlin & Rose, 2010, as cited in Lindqvist, Nilholm Almqvist and Wetso, 2011). Moreover, whether inclusive education could be a successful approach in educating deaf students has been widely debated by the deaf education community (Stinson & Antia, 1999). The educational settings that might be of benefit to deaf pupils and their requirements are discussed in the next section.

2.5.3 Provision of Support Services for Deaf Pupils

This section highlights inclusive education as an educational setting that could be more likely to be better place for deaf pupils.

Ainscow (2005) states that a basic human right and the foundation for a just society is education and that a main challenge fronting educational systems around the world is inclusion. Lindsay (2007) argues that the right to and effectiveness of inclusion are the bases of promoting inclusive education. Social exclusion is claimed to be a result of responses and attitudes to different pupils' backgrounds, such as their race, social class, ethnicity, religion, gender and ability. Thus, eliminating such exclusion is fundamental aim of inclusive education (Ainscow, 2005). Furthermore, social policy and education should embrace the aim of inclusion (Mittler, 2012).

A criticism of inclusive education is that it promises more than it provides (Florian, 2014). Warnock (2005) has claimed that the inclusion approach should be reconsidered and redefined and that pupils with SEN should be provided an

appropriate education regardless of the type of educational setting. This perception might have been suggested as a result of the trend towards reducing the number of special schools without considering whether these schools might be the best educational alternative for some special education needs (SEN) (Warnock, 2005). It is claimed that such a concept might be determined according to different concepts of inclusion (Doherty, 2011). In the UK, for instance, inclusive education is the participation, presence and achievement of all pupils in mainstream schools (Ainscow et al., 2003).

Equality of rights for every child to have an education which takes into account individual differences are fundamental issues in provision for children with SEN (Terzi, 2010). In some countries, such as England, the identification of children's differences in learning is based on educational need, for instance, children who need additional or different provision than that provided in a mainstream school (Terzi, 2010). However, Norwich (2010) argues that there might be concerns regarding the concept of SEN as a suitable approach for identifying children's diversity. The possible discrimination and labelling that are used in this concept might also emphasise individual differences as deficits, so that SEN might be treated according to these deficits (Barton, 2003, as cited in Terzi, 2010).

The SEN Code of Practice (2001) focuses on ensuring that children with special educational needs receive top priority and the opportunity for an education without any kind of discrimination or segregation: "The Code sets out guidance on policies and procedures aimed at enabling pupils with special educational needs (SEN) to reach their full potential, to be included fully in their school communities and make a successful transition to adulthood" (SEN Code of Practice, 2001, p. 6). It is also argued that the role of preparation for participation in social arrangements that is

played by schools and enhanced by inclusion might be a process towards fulfilling the aim of an inclusive society (Terzi, 2010).

From the researcher's experience in Saudi Arabia (as a deaf teacher, manager of a deaf school and supervisor for 18 years in the field of deaf pupils' education), it seems that there are large differences between the diverse special educational environments, favouring mainstream schools in terms of more opportunities for normally hearing and social interaction. In addition, different studies indicate that there might be negative aspects if deaf pupils are educated in special schools. For instance, Vernon and Daigle-King (1999) and Willis and Vernon (2002) found that some deaf children and adolescents admitted that at the age of 12 or younger they had strong or confirmed indications of sexual abuse and communication problems associated with deafness, which were frequently compounded by inappropriate educational approaches. Therefore, special schools with residential facilities are far more likely to expose younger deaf children to some kind of sexual abuse compared to mainstream schools.

According to one RNID report (2002), a research project carried out in 2002 covering 25 different mainstream schools in 16 areas across England, under the heading of "Deaf Inclusion: What deaf pupils think", established five main key findings in favour of deaf pupils' inclusion. Firstly, advantages based upon pupils' views on deafness/improving identity, whereas disadvantages consisted of treating them as different from hearing people (which can be rejecting or isolating) and asking embarrassing questions. A second group of findings regarding the mainstream school ethos suggested that pupils had both positive and negative experiences of communicating with teachers and hearing pupils (RNID, 2002).

The third group of RNID project findings was regarding staff roles towards deaf pupils. Firstly, the role of teacher assistants, which could be seen as helping and supporting active communication/interpretation; secondly, the role of a unit teacher of the deaf (known in Saudi Arabia as a resource room teacher), which consists of giving emotional support, assessing the different kinds of additional support needs, revising a particular subject, and coordinating support staff. Thirdly, deaf pupils considered mainstream teachers in both positive and negative roles, the former in terms of helping, understanding, being approachable, and dealing with hearing pupils who create trouble, and the latter in terms of giving more homework and monitoring work and behaviour closely.

The lack of understanding of roles of the mainstream classroom teacher and his/her cooperation with the resource room teacher should be addressed. Also, it was suggested that the responsibilities of the resource room teacher should be determined so that any ambiguity in the role might be avoided. For instance, these responsibilities could involve collaborating and consulting with the mainstream classroom teachers and previewing and reviewing activities, tasks and vocabulary (Miller, 2008).

The fourth group of findings of the RNID research team was regarding academic inclusion: that is, pupils in inclusive settings depend on a wide range of awareness and expertise which relates to mainstream teachers' active interaction skills. The fifth group of findings concerned social inclusion, and how a school can be a better place for all deaf children in terms of their personal development. The project team found that deaf pupils preferred to be treated the same as all the other children but appreciated others' awareness of their deafness.

This kind of education has achieved tangible results in the Arab world during the last 20 years in the field of educational and social care for people with special needs, enabling them to achieve the level of education and skills required to be productive members of society (League of Arab States, 2010). However, this work needs further review due to its specificity and as a field that raise the urgent need to gain from the experiences of others, particularly in developed societies. Moreover, the researcher believes that the quality of these services should be significantly improved and stakeholders' voices should be taken into account in such improvement.

Farrell (2001) argues that the education of students with special needs has made considerable achievements despite the fact that many thought it would not be feasible in reality. Perhaps the most important of these achievements is the changing culture and the development of the educational methods that are being used with these students. Such educational methods are based on scientific research (Ainscow, 2007; DfES, 2001), which has encouraged the appearance of an unprecedented movement towards the inclusion of these students in mainstream schools, rather than their separation and segregation in schools and special centres. Hintermair (2013) claims that better scores on most scales (for example, socially and academically) have been gained by hearing-impaired students who study in mainstream schools when compared with students at schools for the deaf. Moreover, inclusive education can enhance community within the society and thus associated regulations have been developed towards this end (UK Department for Education and Employment [DfEE], 1997; Special Educational Needs and Disability (NI) Order [SENDO] 2005, as cited in Doherty, 2011).

Ainscow (2007) suggests that inclusion emphasises a process rather than the outcomes and is about removing barriers and recognising the identity of all students.

He also states that particular emphasis should involve the inclusion at school of such groups of students who might be at risk of exclusion or marginalisation. However, Frederickson and Cline (2002) highlight that development in inclusion concepts might not be clear for staff who work in schools, resulting in discrimination and reduced expectations of children from minority groups. An illustration of such a disadvantage is that there might be a failure to consider or make reference to minority issues in constructing new regulations of inclusive education.

Cambra (2002) indicates that acceptance of hearing-impaired pupils within mainstream schools by staff and their colleagues is the basis of inclusive education. However, the social interaction which should occur within the education environment might not be guaranteed by placing children who are deaf or have a hearing difficulty in the same physical location as children who are hearing. Nonetheless, "There are times when a child who is D/HH [deaf or hard of hearing] is the only one in his or her school and can experience well developed academic skills and social relationships with hearing peers" (Special Education Services, 2009, p. 9). In England, education system celebrating diversity through Personal, Social and Health Education (PSHE) and Circle Time activities in primary schools.

It is claimed that the trend towards inclusion is directed towards effective schooling which can meet the needs of all learners, in spite of the large individual differences between them (Ainscow & Kaplan, 2004). However, Powers (2002) resists this notion, suggesting that pupils with SEN might not benefit from the experience of inclusion in a mainstream school. Furthermore, effective conditions for inclusion should be available, otherwise the concept will not be viable. Self-identity could also be promoted by providing an educational environment in which direct communication with peers and professional personnel takes place. Thus, appropriate

educational placement is considered the main challenge that could face a deaf child and his/her family and professionals.

Teachers should implement and reflect upon one of the most important issues: an inclusive pedagogy that could enhance the inclusive education approach. According to Florian (2014), "inclusive pedagogy is an approach to teaching and learning that supports teachers to respond to individual differences between learners, but avoids the marginalisation that can occur when some students are treated differently" (p. 289).

Inclusive practices are referred to as those overcoming barriers to participation and learning by involvement, which might not be mainly related to involving new technology, but rather includes social learning processes (Ainscow, 2005). The educational reforms that could enhance inclusion might involve improving aspects of culture and practices and a policy which is about "school improvement with attitude" (Ainscow, Booth & Dyson, 2006a, p. 12). Moreover, an improved school can be a more inclusive school, which involves values such as a principled approach to education, putting these values into practice and contributing to the improvement of the community (Ainscow et al., 2006a). Nevertheless, uncertainty regarding the implications for practice and particular institutional contexts, rather than the broader context, might affect the framework of such values of inclusion (Ainscow et al., 2006a).

In recent years, a commitment to the inclusive development of education has been adopted by international organisations and national governments (Ainscow, Booth & Dyson, 2006b). In England, for instance, a form of guidance has been implemented (such as, the Index for Inclusion from Booth and Ainscow, 2002) in terms of

participation and educational achievements for all students, including those who have been marginalised (Ainscow et al., 2006b). However, in many countries, another agenda was formulated, known as "the standards agenda", which is "an approach to educational reforms which seeks to 'drive up' standards of attainment, including workforce skill levels and ultimately national competitiveness in a globalized economy" (Lipman, as cited in Ainscow et al., 2004, p. 296; Wolf, 2002).

Conflict between inclusion and the "standards agenda" can exist due to differences in views and ways of thinking about raising school standards and inclusive education (Ainscow et al., 2006a). Therefore, significant tensions have been detected by a number of studies in terms of systems becoming more inclusive and attempting to comply with features of the standards agenda that might be different from the principle of inclusion principle (Ainscow et al., 2006b). Moreover, it is argued that there is a lack of research studies that evaluate the theory and practice of inclusive education, despite increasing amounts of research promoting such an approach for children with SEN (Hornby, 2012). Furthermore, effective inclusive education requires not only concerns regarding the facilities of school as place, but also substantial considerations of curricula, teaching strategies and expert teachers (Terzi, 2010).

Warnock (2010) argues that a difficulty could be occurred as a result of misunderstanding of inclusion concept that might result in children being only physically included rather than both physically and emotionally included within the project of learning that is provided in mainstream schools. However, confusion regarding the ideal approach between the two concepts of special educational needs and inclusion might still exist. Warnock, who published the Warnock Report in 1978, a watershed report on the education of children with SEN, has argued that confusion

still permeates the field today (Terzi, 2010). It is claimed that such confusion might be related to the concept of special educational needs and to the ideal of inclusion, whether an education system should treat all children the same rather than treating them differently according to their needs. Thus, the concept of special educational needs often leads to confusion and ambiguity, as this concept does not differentiate between children with various types of SEN (Terzi, 2010).

2.6 Treatment and Management of Hearing Impairment in Children

The previous section discussed debates surrounding optional educational provision. This section presents the types of medical treatment in terms of the kinds of treatment and management that could be delivered to children with deafness or hearing impairment. Although each kind of treatment is available from different providers (for instance, medical treatment by the Ministry of Health and educational provision by the Ministry of Education), each of them is complementary to the others.

Every child with hearing impairment might need potential treatment, as no personalised treatment plan or management would be suitable for all children with deafness or hearing impairment. However, planning substantial intervention that includes modifications necessary, follow-ups and monitoring to this intervention could play a positive role in enhancing the ability of a deaf child, particularly in terms of academic skills. Different options can be provided for children with hearing loss and to their families. For example, helping a child and a family in learning how to communicate can be achieved by working with a professional team. The early

diagnosis of congenital hearing impairment has also been significantly improved by universal newborn hearing screening (UNHS) (Kim, Jeong, Lee & Kim, 2009).

Children's ability to improve language, social skills and speech will be affected by hearing impairment. Therefore, starting to receive services as early as possible would support the child's speech, language, and social skills in reaching his/her full potential (White, 2006). Early intervention and detection and then accessing special education programmes could be the key to enhancing a child's communication skills. It is claimed that early detection of hearing impairment and timely intervention are considered critical for children's cognitive, verbal, behavioural, and social development (Chapman et al., 2011). However, despite significant advances that are indicated regarding the important of early identification and the role of inclusive intervention, providing effective interventions remains to be a challenge for professional working in this field and, therefore, this need to be addressed by professionals (Kaiser and Roberts, 2011). Further discussion regarding early intervention as a factor that could enhance the outcome of CIs is presented later in this section.

The process of measurement and diagnostic tests for pupils with SEN in Saudi Arabia, as this has not received sufficient attention from either the entities responsible for the preparation and training of specialised personnel in the process of measurement and diagnosis or in terms of the diagnostic process when practised in the field (further information about this was provided by the participants and is presented in the Results chapter). Hence, mistakes in the process of diagnosis and judgement have been made which result in negative consequences on children and their families. For instance, setting children, according to inaccurate diagnosing, in an educational place higher than the level of their abilities might be as harmful as

putting them in a place which is lower. As a result, an error in diagnosis can cause a ruling to be issued for such children and give them a lifelong stigma.

The fact that a child's development can be greatly improved by the appropriate use of measurement and diagnostic services has been demonstrated by research. White (2006) argues that a revolution in the ability to identify and provide early intervention for children with hearing impairment during the first year of their life, is created by the combination of technological advances in screening and diagnostic equipment and hearing technologies.

Significant progress could also often be possible for those children who are identified early and provided with appropriate hearing technologies and early intervention. Thus, the learning of language and other important skills by children with hearing impairment could be helped by early intervention programme services. Early detection and intervention are considered a significant service delivered in developed countries such as the UK and the US. Any family whose child has a hearing loss can receive timely follow-up testing and services or interventions. However, the Department for Education and Skills in the UK has stated that "families face unacceptable variations in the level of support available from their school, local authority or local health services" (DfES, 2004b, Introduction).

Hearing aids continue to be a significant treatment that is delivered to children with hearing impairment. Hearing aids are classified according to their shape, position on the body, and function (Moore, 2001). Over the last decade, the world has witnessed a great deal of improvement in developing sophisticated technologies for hearing aids and other relevant equipment, which has led to better communication opportunities for hearing-impaired pupils. However, despite improvements in the

verbal-language input that could be enhanced by hearing aids, restoring hearing would not necessarily be achieved by such aids. Moore (2001) argues that hearing aids can amplify, improve and differentiate sound frequencies, but they will not function as effectively as the natural ear.

A number of alternatives that could help to increase deaf or hearing impaired people's ability to hear and communicate, such as conventional hearing aids and an implant in the middle ear that is a device implanted by surgery and suitable for hearing impaired who are not capable to have hearing aids. Moreover, for profoundly deaf who find the hearing aid is not powerful, cochlear implants, which are implanted hearing devices in the inner ear, can be suitable for them (UK National Health Service [NHS], 2013). For instance, if there is a main problem in a child's outer or middle ear, such as having no ear canal, then a specific aid may be prescribed, such as a cochlear implant (Moore, 2001).

Regulation and an effective government system might be the key issue in delivering services to people with SEN. In the UK, an effective system of hearing aid distribution is run by the NHS, which provides all kinds of treatment suitable for people with hearing impairment. The NHS also provides sign language training, such as in British Sign Language (BSL) (NHS, 2013). Such comprehensive treatments, which are provided by one association that has all the databases throughout the UK, provides a solid foundation for support children and their families. In Saudi Arabia, although significant numbers of hearing aids are provided to children with hearing impairments, multiple service providers and a lack of coordination between them can cause difficulties and delays and even prevent the delivery of these aids to children and their families (Aloheeb, 2009).

In addition, parents as well as school staff have an influence on hearing-impaired children's knowledge and attitudes. Thus, it is an important issue that the Ministry of Education, Health and Social Affairs in Saudi Arabia has a fixed policy of coordination and supporting services for families and parents, which could be a fundamental factor in meeting the development needs of these students with special needs. This situation has arisen as a consequence of the rationale that the parents of students with special needs would be likely to demand extra guidance compared to the parents of students with no special needs. For instance, in the US, the Individuals with Disabilities Education Improvement Act 2004 (IDEA, 2004) led to the provision of a number of services. IDEA (2004) states that services will be provided for all children under the age of three who might be at risk of having developmental delays.

It is claimed that cochlear implants are considered the substantial currently available management for many people with hearing loss. In many developed as well as developing countries, such as the US, UK, Saudi Arabia and Jordan, cochlear implantation has become a significant treatment and management that could be provided to profoundly deaf children (Alkhamra, 2015; Archbold & O'Donoghue, 2009; IDEA, 2004; RCHD, 2014). Furthermore, revising recommendations regarding CI are often conducted when addressing the initial concern against a cochlear implant (O'Brien et al., 2010). Such treatment directly stimulates the auditory nerve in order to compensate for the lost hair cell function (Applera & Goodrich, 2000). Archbold and O'Donoghue (2009) argue that

> Cochlear implantation in children is now accepted management of profoundly deaf children, and has proven to be the most significant change in the management of childhood hearing loss, achieving outcomes which would not have been contemplated even 10-15 years ago (p.457).

However, it is also stated that a cochlear implant is provided as a surgical treatment for deaf people if they would not benefit from hearing aids (HLAA, 2013).

There is increasing literature presenting the benefits of CI in the areas of communication and socialisation that indicating to interventions that could improve deaf child's social skills (Martin et al., 2011). It is crucial to point out that there is a significant gap in the research that has investigated CI and its users and the outcomes of such treatment in Saudi Arabia.

Cochlear implant treatment is discussed in detail in the next section. The effectiveness, nature and development of cochlear implants, their benefits and the predicting factors affecting the outcomes of children with CIs (as contained in previous studies) are also presented.

2.6.1 Cochlear Implant Treatment

2.6.1.1 Nature of a Cochlear Implant: Its Benefits and Beneficiaries

The dominant management for profound and severe paediatric deafness in most developed nations is cochlear implantation. In June 1990, the US Food and Drug Administration (FDA) approved cochlear implantation for children that substantially enhanced the management alternatives for children who are severe and profoundly deaf (Graham et al., 2010). According to Archbold et al. (2008), "The increasing availability of cochlear implants has held out the prospect of higher levels of literacy for profoundly deaf children" (p. 1472). There is a significant expectation of high rates of implantation in young children and infants (Hyde, Punch & Grimbeek, 2011). In the UK, since the technique was introduced in 1989, approximately 2,000 deaf children have had an implant (MRC IHR, 2004, as cited in Tracey & Whynesb,

2009). Whereas, in Saudi Arabia, as mentioned in the first chapter, there are 1,200 CI operations every year, which is considered a significant number compared with numbers of surgeries in other countries such as UK.

By CI, sounds are converted into electrical signals that are sent directly to the brain by the auditory nerve whereas conventional digital hearing aids are only making noises lauder. Archbold and O'Donoghue (2009) state that "Cochlear implants convert the acoustic signal into electrical pulses, providing electrical stimulation to the intact auditory nerve, by-passing the damaged sensory structures of the inner ear" (p. 458). It has also been explained that CI is an electronic device that is surgically implanted for patient with a severe to profound sensorineural hearing loss (Pisoni et al., 2008).

CI can provide a means of hearing for profoundly deaf children, who would not benefit from conventional hearing aids, can be provided by CIs (Archbold & O'Donoghue, 2009; Kim et al., 2009). It is claimed that:

> When someone is profoundly deaf, it is usually because most of the hair cells in the cochlea have stopped working. The cochlear implant works by stimulating the hearing nerves in the inner ear directly, sending a sensation of sound to the brain (RNID-Action on Hearing Loss, 2012, p. 6).

Figure 2: Advanced bionics harmony system, an internal and external device (Archbold & O'Donoghue, 2009 p:458)

Figure 2 shows that cochlear implants include two parts, as follows:

> The external components: microphone, processor and transmitter, usually worn behind the ear, but may be body worn. This captures the speech signal, transforms it into an electronic equivalent and transmits it through the intact skin to the internal receiver the internal device consisting of a receiver which is surgically inserted into the mastoid bone and an electrode array that is inserted into the cochlea in close proximity to the auditory nerve. This receives the transmitted speech signals and delivers them to pre-determined locations (or frequency bands) on the auditory nerve array (Archbold & O'Donoghue, 2009, p. 458).

Figure 3 describes the procedures in a cochlear implantation programme. First a diagnosing of hearing loss is conducted and then a hearing aid would be fitted as the first step for a child who is severely to profoundly deaf for at least six months. During these 3-6 months auditory habitation and speech evaluation will be consulted.

Then, re-diagnosing of hearing and habitation are undertaken. If hearing aid does not benefit the child, cochlear implantations are considered (Kim et al., 2009). However, O'Brien et al. (2010) claim that candidacy criteria might change over time, which could raise concerns for both professionals and families. After having CI, sound processor and microphone will be fitted and switched on. Finally, habitation of auditory, speech and language will be implemented.

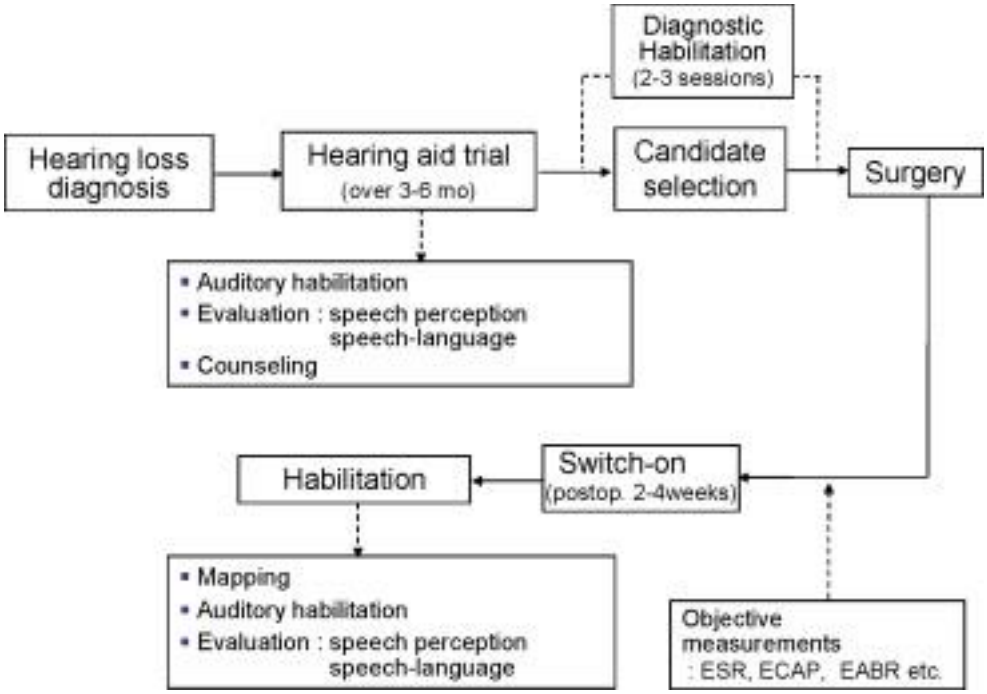

Figure 3: The procedures of a cochlear implantation programme (Kim et al., 2009 p:7)

Using hearing devices such as hearing aids and cochlear implants could be critical for a deaf child in reducing the duration of auditory deprivation between the onset of deafness and intervention (Kim et al., 2009). Furthermore, the majority of research has focused upon spoken-language development, while less attention in research studies has been paid to broader outcomes of CI, including psychosocial and

educational outcomes, as well as parents' expectations and experiences (Spencer and Marschark, 2006).

2.6.1.2 Benefits of Cochlear Implant Surgery

Cochlear implantation could help profoundly deaf children in terms of hearing and language, also help the deaf child's educationally and socially. In respect to hearing, it is reported that "paediatric cochlear implants are surgically-implanted electronic devices, which enable profoundly deaf children to experience some sensation of sound" (Tracey & Whynesb, 2009, p. 400). Moreover, it is reported that "parents were most satisfied with improved/expanded social relations, improved communication the development of spoken language" (Huttunen et al., 2009, p. 1786). Enhanced hearing, speech, psychosocial and educational outcomes are included among the considerable benefits to a deaf child that could be provided by implantation (Archbold et al., 2002a).

With regard to speech and communication, access to speech through hearing for many profoundly deaf children could be gained and provided by cochlear implantation (Wheeler, Archbold, Hardie & Watson, 2009). Evidence has been found that strongly suggests that CI help develop speech perception and production (Geers, 2002). In a study of 30 deaf children with CIs, Beadle et al., (2005) found that 29 of these children showed substantial progress in speech perception and production after continuing to use their devices 10 to 14 years after implantation. This study also claims that long-term communication benefits have been provided by CI to the profoundly deaf. Developed an accurate consonant-production and expressive and receptive language were demonstrated by children with CIs (Connor, Hieber, Arts and Zwolan, 2000). However, a complex relationship between children's

performance and a cochlear implant might have appeared as a result of different variables, such as age at implantation and the teaching approach engaged by the school (Cannor et al., 2000).

With respect to educational progress, Beadle et al. (2005) state that children who have a CI for 10 to 14 years have been actively studying and working and can be involved in communities. In a study conducted in Austria, for instance, the educational performance of pupils with CIs did not differ from that of the wider Austrian population (Huber, Wolfgang & Klaus, 2008). However, deaf pupils show a delay in reading skills that was observed to rise with age (Archbold et al., 2008). Thus, in a study that aims to understand the parental perspective on paediatric cochlear implantation over time, child's education might be a significant area of contention among parents of children with CIs (Tracey & Whynesb, 2009). Nevertheless, there was consensus among the majority of these parents that their decision to proceed with implantation was correct.

Regarding inclusive education (educational placements), attending mainstream rather than special schools is significantly shown by pupils with CIs as outcome of the CI. (O'Donoghue & Archbold, 2005). However, there might be substantial variation in outcomes from implantation. In a study investigating 52 cochlear implant users, Huber et al. (2008) suggest that 60% of pupils with CI who graduated from secondary school were in mainstream schools and two pupils studied at university. It is crucial to point out that in an era of technological development, the equipment that can be available and engaged in schools can help pupils with CIs to be included within mainstream classrooms. Moreover, it is claimed that new technological and knowledge developments can play a significant role in enhancing family practices

and knowledge of cochlear implantation (Tracey & Whynesb, 2009). Such enhancing of families experiences can improve the benefit of CI upon their child.

2.6.1.3 Parents' Expectations and Decision-Making Process

It is argued that the five most important factors that could contribute to the suffering of the parents of a child with hearing impairment who is newly diagnosed are denial, lack of information about this condition, emotional isolation, as well as the real difficulties their impaired child could face and having hopes that the child's hearing might get better (Froude, 2003). Therefore, according to Marschark, Sarchet, Rhoten, & Zupan (2010), early intervention programmes are just as important for parents as they are for deaf children, so many of these programmes are referred to now as parent-infant rather than early intervention programmes. They are mainly planned to assist deaf and hard-of-hearing children from birth until the age they enter pre-school. Language development, parent-child communication, social skills and testing for hearing aids and cochlear implants are focused upon in such early intervention programmes. The parents will be part of these programmes and will be provided with strategies and instructions for improving their children's quality of life, including using sign language and speech training.

The complication of treating childhood deafness has been increased by advances in cochlear implant technology (Yuelin, Baind & Steinbergc, 2004). Furthermore, Steinberg et al. (2000) argue that the "parents of children who are deaf are required to make decisions shortly after diagnosis that will affect the child's method of communication and educational placement" (p. 99). An empirical understanding of cochlear implantation and its aim for a prelingual deaf child are the basis of bioethical discourse (Kermit, 2009). It is also argued that "perhaps the most

dominating question in the bioethical discourse on paediatric cochlear implantation is that of whether or not a prelingual deaf child should undergo surgery" (Kermit, 2009, p. 91).

Eligibility and professionals' recommendations strongly influence the decision to consider cochlear implantation. However, parental preferences, goals, values, and beliefs might, for some parents, be the decision directors (Yuelin et al., 2004). Therefore, it is important that parental goals, values, and beliefs are considered carefully with a professionals' awareness in evaluating a child's candidacy for implantation (Yuelin et al., 2004). However, in one study 20 families of deaf children were involved in a study regarding the role of parental values and preferences in this decision-making process, and it was found that there were no correlations between parents' decisions to choose cochlear implantation and the wide variability in parental preferences (Steinberg, Brainsky, Bain, Montoya, Indenbaum and Potsic, 2000).

Sacha and Whynes (2004) present a study that involved 216 families of children with CIs, which found that the majority of the parents did not regret their decision to having CI. Comparisons between children with and without CIs are important to investigate reasons behind whether to have such treatment. Hence, parental decision-making, values and beliefs could be studied and the findings provided to professionals and policy-makers in order to deliver effective services for deaf children and their families who consider CI. Punch and Hyde (2011) also highlight that reaching full potential personally, educationally, and socially for children with CIs might face some areas where challenges continue for implant clinics, parents and educators.

2.6.1.4 Factors Affecting Outcomes of Children with Cochlear Implants

Brief outline of factors to be discussed in this section. Predicting reliable outcome prior implantation and success with a CI has not been possible for clinicians and researchers (Pisoni et al., 2008). This could be a consequence of many complex interactions that might exist, such as the following:

- The newly-acquired sensory capabilities of a child after a period of auditory deprivation.
- Properties of the language-learning environment.
- Various interactions with parents and caregivers that the child is exposed to after implantation (Pisoni et al., 2008).

Moreover, identifying those children who may be at risk from poor outcomes might be difficult for clinicians and parents. However, there are a number of demographic, medical and educational factors associated with speech and language outcomes and benefits following implantation. Awareness and consideration of those factors affected by profound deafness are critical for diagnosis, prediction, and treatment and for explaining why some children do poorly with their CIs (Pisoni et al., 2008).

Spencer & Marschark (2006) argue that almost all of the clinical research on CIs has been concerned with device efficacy. Whereas, there is a lack of understanding regarding the reasons for the enormous variability in outcomes and benefits following implantation. Archbold and O'Donoghue (2009) claim that "there remains huge, unexplained, variation in outcomes from implantation and the challenges of ensuring life-long use and benefit remain" (p. 457). Therefore, different variables and factors that might affect the outcome of CIs are presented and discussed in the next section.

2.6.1.4.1 Age of Implantation

A long-term positive impact on auditory and verbal development could be gained by early cochlear implantation. However, this early intervention might not affect age-appropriate reading levels in high school (Geers, Tobey, Moog and Brenner, 2008). The impact of CI on the improvement of reading skills in deaf pupils could be enhanced by an early age of implantation and improved technology (Archbold et al., 2008; Geers & Brenner, 2003; Stacey, Fortnum, Barton & Summerfield, 2006). Therefore, it is suggested that the development of reading skills is significantly affected by the factor of age at implantation. Archbold et al. (2008) argue that "in children implanted below the age of 42 months, reading progress was in line with chronological age" (p. 1471). Therefore, the early implantation can be a significant factor in increased positive benefit of CI.

Based on the predictive value of the Nottingham Children's Implant Profile (NChIP), young age at implantation, short period of hearing loss, children's learning styles, and family structure were the most important predictors of CI outcomes (Nikolopoulos, Gibbin & Dyar, 2004). The newborn screening that is conducted in developed countries has enhanced the early identification of deafness and then early intervention by cochlear implantation. However, this might not be the case in developing countries (Archbold & O'Donoghue, 2009). With regard to Saudi Arabia, this screening was authorised in 2015 (Ministry of Education, 2015). In Japan, for example, Oliver (2013) states that a limited percentage of children (only 3-4%) who are under the age of three years are provided with a CI at less than 18 months of age.

2.6.1.4.2 Early Intervention Programmes: A Brief Overview, Definition and their Importance

A newborn child's cognitive, behavioural and social development might be critically affected by the early detection of hearing impairment and timely intervention. Hence, preventing or reducing negative developmental consequences could be enhanced by the initiation of appropriate early intervention services before s/he is six months old (Chapman et al., 2011). The process of the modification or prevention of unwanted outcomes by planned action is defined as an intervention (Chapman et al., 2011). The intervention aims not just to help children acquire new skills and knowledge, but also to use and maintain these skills and knowledge (Dockrell & Messer, 1999). Early intervention programmes for babies and toddlers fall into two main stages (IDEA, 2004), as follows:

1. Early intervention from 0-3 years old: infants, toddlers with disabilities and their families are delivered a system of support services.
2. Special education and related services for children (aged 3-5) who are in the public school system either for school-aged children or pre-schoolers.

According to the US Preventive Services Task Force (USPSTF, 2008, as cited in Callow-Heusser, 2011), communication challenges that are faced by children with hearing loss might have a negative impact on a child's behaviour and his/her social well-being. Moreover, such challenges result in lower educational outcomes compared with peers who have no hearing impairment and who are of the same age. A considerable issue is that understanding fluent spoken communication in all or many social situations may be difficult for deaf students.

It is important to state here that the UK Government's Green Paper, which was issued recently by the Department for Education (DfE, 2011), focused on a comprehensive solution in order to respond to the frustrations of children who are defined as having special needs, their families and the specialists who work with them. This comprehensive solution aims to enhance better life outcomes for children with special needs from their early years. To achieve such aims, the Green Paper (2011) states that identifying and meeting children's needs can be ensured by consideration of three significant issues: the accessibility of healthcare, early education and child care to all children; working together with parents; and joining up education, health and social care as a package of provision. It is indeed a challenge which could be faced in the Saudi context, as a lack of coordination exists between the ministries and associations which provide services to children with special needs. The UK Green Paper also places emphasis on ensuring that the plan reflects families' ambitions for their children and it is important to point out that such a plan is reviewed continually to respond to their changing needs. Such an approach could be considered as a framework for children who are defined as having special needs. This might help in designing a better system in Saudi Arabia, in which all organisations (education, health, social and parents) are fully engaged in the assessment and development of a child or young person's individual plan.

2.6.1.4.3 CI Role in Enhancing Inclusive Education

Inclusive education is promoted on the basis that including children in mainstream education is their right (Ainscow, 2005; Ainscow et al., 2006; Lindsay, 2007). Lindsay (2007) also claims that the key policy objective for the education of children with special needs and disabilities is inclusive education or mainstreaming. The number of profoundly deaf pupils who are educated in mainstream classrooms

alongside with normally hearing pupils has increased as a result of the availability of cochlear implants (Fitzpatrick & Olds, 2015).

Deaf children have a problem with the acquisition of language (Doherty, 2011). The majority of these children are born of hearing parents (Doherty, 2011), thus, studying with hearing peers in mainstream classrooms might enhance the spoken language for pupils with CI and this environment could be as stimulating as the child's home. Pupils with CI can be affected in different aspects as a result of having the implant (Huttunen et al., 2009).

Involvement in the local community and active learning have been indicated as outcomes of using CI for deaf pupils (Beadle et al., 2005). De Raeve (2010) argues that as larger proportions of pupils with CIs include in mainstream schools, and smaller number to deaf schools, speech intelligibly and choosing a spoken language as their main approach of communication can be acquired by these pupils. However, the necessity for services which will be different depending upon the child's language level, age and additional child-specific factors is not eliminated by mainstream placements (De Raeve, 2010). De Raeve (2010) also claims that there is an evidence indicates that heterogeneous outcomes in the outcomes of paediatric implantation.

Huber et al. (2008) state that, in their research, integrating well into the hearing world concerning their schooling and postgraduate development were the findings of the majority of CI users involved in the study. Moreover, there are benefits of CI that might enhance inclusive education. Parents were satisfied with these benefits, such as improved social relations, communication and self-reliance for the child (Huttunen et al., 2009). However, it is argued that embracing the diversity of different students

and addressing appropriately the specific needs of each child might be a challenge for deaf education (De Raeve, 2011).

"In recent years, inclusion has become a 'global agenda'' (Pijl et al., 1997, as cited in Ainscow et al., 2006, p. 295). Inclusive education could play a significant role in enhancing the educational progress of pupils with CI. Such education is suggested as being more effective in the educational field (Lindsay, 2007). Considerable efforts have been conducted to implement educational policy and practice in a more inclusive pathway (Mittler, 2000). However, Hocutt (1996) argues that the advantage of placement rather than instruction has no convincing evidence, as it is a critical factor in student educational or social success. Providing an opportunity for students to engage with their peers and express their views (students' voices) might enhance their experiences and ability to learn. Messiou (2011) suggests that exploring and developing practices in schools in order to enhance pupils' experiences can be achieved by taking students' views into account.

Ainscow (2005) argues that the educational systems around the world are facing a major challenge, namely, inclusion. As mentioned earlier, in order to improve role of inclusive education, different requirements should be fulfilled. The Salamanca Statement emphasises that moving towards inclusion implies the development of schools rather than only integrating vulnerable groups of students into local schools (Ainscow, 2005). Hence, practices that can "reach out to all learners" (Ainscow, 1999 cited in Ainscow, 2005 p:8) are essential and are required to be developed by schools.

Ainscow et al. (2003) claim that inclusive education indicates the presence, participation and achievement of all pupils in mainstream schools. Staff should have

the skills to meet these challenges and need to have flexibility towards and knowledge of technology and professional training (De Raeve, 2011).

All groups of learners should participate and be enhanced educationally by schools, rather than simply focusing on increasing their numbers in school (Ainscow et al., 2006). An environment which will utilise the hearing and accommodate the psycho-social needs of pupils with CIs should also be provided by teachers in school (De Raeve, 2011). Teacher educators and policy makers in many parts of the world are concerned in the preparation of teachers to meet the challenges of teaching in diverse classrooms as a result of the substantial role that teachers play in influencing student achievement (Spratt & Florian, 2015). Student achievement might also be enhanced by an inclusive pedagogy, which is an approach that is developed by research and applied professionally by teachers who have maintained a significant level of academic achievement in these diverse classrooms (Florian & Black-Hawkins, 2011, as cited in Spratta & Florian, 2015).

Inclusive education could be implemented differently according to each country. Foster et al. (2003, as cited in Doherty, 2011) describe inclusive education as a "culturally relative term" in the way such education is conducted. In many countries, the majority of pupils with CIs study either in mainstream classrooms or hearing impaired units attached to mainstream schools. For instance, in the UK, these pupils are provided with a variety of educational placements, including the aforementioned two types of educational settings (Sacha & Whynesb, 2009). In the US, "the majority of disabled children receive at least some of their education in the mainstream" (Karchmer & Mitchell, 2003, as cited in Doherty, 2011, p. 792). In Austria, Huber et al. (2008) claim that the percentage of pupils with CIs who are of school age and attend mainstream schools is more than 80%.

Ultimately, mainstream classrooms might be an appropriate educational placement for deaf pupils with CIs. This type of placement could enhance their learning experience and social skills, as well as their spoken development. However, schools in Saudi Arabia need to implement inclusive education fully on the ground. Such implementation might be achieved, not only by opening the doors of mainstream classrooms to all learners, but also by developing the policies, practices and culture of such education.

2.6.1.4.4 Communication Approaches Used by Pupils with CI

The mode of communication approach that is used with pupils who use CI might affect outcomes such as language and education. It is claimed that choosing the type of communication approach to be adopted has received substantial attention, rather than the choices that are made by parents before and after cochlear implantation (Wheeler et al., 2009). Sign language, oral commination and total communication are types of commination approaches. According to Cannor et al. (2000):

> Educational programs that used an oral communication (OC) approach focused on the development of spoken language, whereas educational programs that used a total communication (TC) approach focused on the development of language using both signed and spoken language (p. 1185).

In a study investigating the impact of the Danish bilingual/bicultural approach on deaf education, literacy skills among students with hearing impairment were improved by this approach, although it did not reduce all literacy difficulties (Dammeyer, 2104). Furthermore, enhanced expressive and receptive vocabulary over time have been demonstrated by pupils with CI, as they used their device and the implants before the age of five years old regardless of the communications approaches used (Cannor et al., 2000). However, a large variability in outcomes

remains a significant concern, despite the ability to develop good language skills demonstrated by children with CI (Boons et al., 2012).

It is not only at school but also in the home that an appropriate communication approach should be involved. Oral communication used by parents in communicating with their child who has a CI might enhance language outcomes (Cannor et al., 2000). Wheeler et al. (2009) state that the most effective way of communicating with a deaf child will be chosen by the parents. However, the development of oral communication skills would be retained as a goal.

2.6.1.4.5 Rehabilitation Programmes

Rehabilitation programmes could play a significant role in enhancing the positive outcomes of CI. For instance, increasing number of deaf pupils who achieve the spoken language levels of their peers with normally hearing can be enabled by rehabilitation that focuses on speech and auditory skill development (Geers, 2006). Moreover, it is crucial to point out that a great variability in individual achievements amongst children with CIs has been measured in dimensions of auditory, linguistic and cognitive outcomes (Wieringen & Wouters, 2015). Therefore, involving such rehabilitation could help children and their parents to overcome challenges after implantation.

Moreover, understanding the relationship between a child's and the parents' cultural and linguistic diversity might be significant in setting realistic goals and providing appropriate rehabilitation with regard to academic achievements (Wieringen & Wouters, 2015). Interaction with the surrounding environment and reconstruction of the sensory basis of communication are considered as main corrective measures that should be implemented for children who are entitled to cochlear implantation and at

the initial stage of the rehabilitation of young and pre-school children (Sataeva, 2015). The transition of a child towards normal development as a result of cochlear implantation could also be marked as an indication of the completion of the initial phase of the rehabilitative period (Sataeva, 2015).

In recent decades, developing auditory rehabilitation in profoundly deaf children with CIs has been achieved (Hilgenberg et al., 2015). However, in such a process of auditory rehabilitation, a guarantee of economic, social, and educational conditions must be provided (Duarte, Santos, Freitas, Rego & Nunes, 2015). Moreover, a system of ethical health priorities should be developed by societies (Duarte et al., 2015). Nagawh (2010) conducted a study that investigated the effectiveness of rehabilitation programmes in improving speech skills for children with CIs in Saudi Arabia. It was suggested that the ability to hear sounds using a CI did not necessarily mean that a child with a CI could recognise these sounds, so rehabilitation must be provided. In this study, it was also claimed that there is a substantial shortage of rehabilitation programmes, not only in Saudi Arabia, but also in the surrounding Arabic countries.

2.6.1.4.6 Bilateral Implantation

After more than 50 years of unilateral deafness and as a result of electric auditory stimulation, there is now a possibility of developing binaural communication and sound localisation (McNeill, 2012). Simultaneous bilateral implantation for children, with sequential bilateral implantations for those who have already been unilaterally implanted, is recommended by professionals for deaf children as being clinically appropriate (Archbold & O'Donoghue, 2009). The benefits of bilateral cochlear implantation have also been clearly shown by rapidly emerging data (Lustig &

Wackym, 2005). Wie (2010) suggests that it appears to be promising that prelingually deaf children can, after early bilateral implantation, improve complex expressive and receptive spoken language. However, greater difficulties in wearing the second implant than wearing the first during the rehabilitation period have been shown by research (Sparreboom, Leeuw, Snik & Mylanus, 2012). Therefore, it is argued that such results might be important for parents in order to form realistic expectations from sequential bilateral CI (Sparreboom et al., 2012).

Primary benefits in spatial hearing and speech recognition can often be led by sequential bilateral cochlear implantation in profoundly deaf children (Sparreboom, Langereis, Snik & Mylanus, 2015). Furthermore, offering a wide range of benefits regarding involvement and assisting social intercourse with the hearing environment for all children with CIs could be gained by sequential bilateral implantation (Scherf et al., 2009). Communicating by vocalisation is also more likely to be used by profoundly deaf bilaterally implanted children compared with those who are unilaterally implanted (Tait et al., 2010). However, it is crucial to point out that when deaf children are assessed for simultaneous implantation, not all deaf children are suitable, nor do all parents agree to proceed despite the optimal auditory outcome that can be gained by bilateral implantation (Ramsden, Papaioannou, Gordon, James & Papsin, 2009). In addition, with respect to evaluating simultaneous and sequential bilateral implantation, some children are likely in due time to be candidates for sequential bilateral implantation (Ramsden et al., 2009).

2.6.1.4.7 A Team Approach to Management of CI

A team approach is considered a significant factor in enhancing positive outcomes of CI and even from the very inception of the CI intervention (Eisenberg, 2015). Eisenberg (2015) states that:

> Initiation of the pediatric CI program in 1980 saw the team expand with the support of pediatric specialists in audiology, speech-language pathology, psychology, and education of the deaf. Today, other team members may include radiologists, electrophysiologists, neurosurgeons, pediatric anesthesiologists, social workers, physical and occupational therapists (p. 54).

Although research has achieved a substantial success rate for CI results, a skilled team is needed to evaluate their risk to the outcome of cochlear implants in children (Black, Hickson & Black, 2012).

In Jordan, Alkhamra (2015) conducted research exploring the perspective of parents on the cochlear implant process in this country. It was found that there is a consensus amongst parents regarding the importance of a multidisciplinary team approach throughout the different stages of the CI process (Alkhamra, 2015). The facilitated perception of sound and a greater oral communication outcome can be successfully achieved by deaf children who have a CI, if ongoing intervention from a variety of professionals is provided (Mishra & Franck, 2008). O'Brien et al. (2010) highlight the role played by appropriate counselling for patients and families and planning post-implant management as part of a team approach to effective management overall.

2.6.1.4.8 Time Spent Using a CI at Primary School

The period of time spent using a CI in the course of a day might affect the benefit of such treatment, because if the external device (microphone and sound processor)

were to be removed the child would not be able to hear. Preisler, Tvingstedt and Ahlstrom (2005) conducted a study with the aim of highlighting the experiences of children using a CI. It was found that 10 out of 11 students who were involved in the study were using an implant daily, so that these students were able to perceive sounds in the environment. Therefore, both parents and teachers should monitor deaf pupils with CIs and encourage them to use them throughout the whole of the school day. However, these pupils might experience problems some time that require removing the device, at least for a certain amount of time. For instance, the battery for the external device might also need to be changed, as the pupil cannot hear if the battery needs to be replaced.

Pupils with CIs might be bullied by their peers at school as a result of the appearance of the device. Nash, Stengelhofen, Brown and Toombs (2002) state that child might be at risk of Victimisation, Ostracisation and Stigmatisation (VOS) cycle of disadvantages that could be developed as results of having persistent communication problems. Therefore, becoming involved in such a cycle of disadvantage may make this child with communication problem feeling loneliness, helplessness and hopelessness (Nash et al., 2002).

2.6.1.4.9 Socioeconomic Aspect

In developed countries, the cost-effectiveness of paediatric cochlear implantation is well established. However, in low-resource settings, which have limited access to technology, this is not the case (Emmett et al., 2015). In Saudi Arabia, CI intervention, which includes the surgery, the device and rehabilitation in public hospitals, is funded by the government. However, the rehabilitation programmes that are provided by private centres are self-funded by parents. It is important to point out

that there is a direct cost, which includes the surgery and the device, and an indirect cost, which covers rehabilitation and educational programmes.

Additional costs in the two years after implantation are incurred by families of children with CIs, in comparison to families of non-implanted children (Barton, Fortnum, Stacey & Summerfield, 2006). However, it is claimed that a positive effect on quality of life at reasonably direct costs could be provided by cochlear implants for profoundly deaf children (Cheng et al., 2000).

In SA, there is a significant gap in the literature related to the benefit and implications of worldwide routine treatment for deaf children, such as CI. Therefore, it is anticipated that this study will enable all stakeholders to gain and develop understanding of the current situation of deaf pupils with CI at primary school in SA. The following chapter focuses on the Methodology employed for the research study.

Chapter 3: Research Methodology

3.1 Introduction

The methodology section is one of the most important aspects of any research, as it highlights the research design adopted in conducting the study. This chapter outlines the research methodology that was used for structuring the research process. The research methods that were implemented are discussed with reference to pertinent literature. Attention is then turned to describing the participants who were involved in the research and the way in which the pilot study was developed.

3.2 Aims of Research

The rationale for this study lies in wishing to understand the current status of educational progress and issues surrounding the inclusive education of deaf pupils who use CIs in primary schools in SA and to identify factors that affect the benefits of CIs from the perspective of parents, teachers and clinicians. The need to seek greater knowledge of these phenomena is also considered. The overall aims of the research, are expressed in the following research questions which underpin this thesis:

Firstly: To explore the decision-making process and perceptions and expectations of parents regarding CI surgery for their child.

Secondly: To explore post-CI surgery experiences of the benefits of CIs for the educational progress of pupils receiving this treatment, from the perspective of parents, teachers and clinicians. The differences in educational attainment between

pupils with and without CIs will be examined. Factors that might affect the outcomes of CIs will also be discussed.

Thirdly: To explore issues surrounding the educational placement of pupils with CIs from the perspective of parents and teachers. The role of environment, which could affect the educational placement of these students, will also be considered.

3.3 Research Questions

Research Question 1:

What is the parental decision-making process regarding whether to have a CI for their deaf child?

1a. what are the perceptions and expectations of parents prior to deciding to have/not to have CI surgery for their child?

Research Questions 2:

What are the benefits of CIs for the educational progress of deaf pupils in primary school in SA?

2a. what are the post-CI surgery experiences of parents, teachers and clinicians regarding the benefit of CIs for the educational progress of deaf pupils with CIs?

2b. what are the differences between deaf pupils with/without cochlear implants in their educational progress based on school academic results?

2c. what are the participants' perceptions of experiences towards factors affecting the educational progress of deaf pupils with CIs?

Research Question 3:

To what extent does CI surgery affect educational placement of deaf pupils at primary schools in SA?

3a. what are the current types of educational setting for pupils who have CIs in primary school in Riyadh?

3b. what are participants' experiences towards the impact of CIs on enhancing inclusive education for deaf pupils with CIs?

3c. what are the perceptions and experiences regarding the role of the educational environment upon inclusive education for deaf pupils with CIs?

3.4 A Brief Overview of Research Paradigms and Types of Research Methods

There are different paradigms and methodologies which are applied in different sciences. For instance, there are two opposing groups of researchers in the US who are fundamentally divided, particularly between those following positivist and those pursuing interpretivist paradigms. Such division leads to the assumption that these methodologies and paradigms cannot and must not be mixed (Onwuegbuzie & Leech, 2005). Burrell and Morgan (1979) have identified assumptions that directly have implications for research methodology. These assumptions, such as those regarding ontology, epistemology and human nature, demand different research methods.

Researchers adopting a positivist or objective approach to a particular social science issue will choose methods implemented by the natural sciences, so that the phenomenon that is being investigated is observable and measurable. However, it is

claimed that there is a limitation regarding positivism in research. This limitation arises as a consequence of the difficulty in understanding human beings, either in terms of externally measured variables or researcher-imported categories (Heron, 1996).

Another criticism of the positivist framework is that the interpretation of people's experiences through their uniqueness or individual differences might fail to be taken into account (Cohen & Manion, 1994). Thus, other researchers favour more subjective approach, believing that social behaviour is much more personal and so cannot be investigated by the same methods as those used in the natural sciences. The positivist approach uses quantitative methods that are achieved by applying surveys or experiments, in order to search for evidence of an existing theory. Interpretivists on the other hand, use qualitative methods through the study of individual cases, in order to understand a specific characteristic of the subject being studied. In view of these different paradigms, the research methods used in the current study are detailed in the next section.

Types of Research Methods

Webster's Dictionary (1999) states that methodology is the "systematic study of methods that are, can be, or have been applied within a discipline" or "a particular procedure or set of procedures". Thus, a research methodology can be said to be the way in which a piece of research is conducted and designed. For the purposes of the current study, research methods are defined as a "range of approaches used in educational research to gather data which are to be used as a basis for inference and interpretation, for explanation and prediction" (Cohen & Manion, 1994, p. 38).

The two most common research strategies in social science are qualitative and quantitative (Bryman and Bell, 2007). According to Langdridge (2004), an empirical approach to knowledge that is based on belief can be said to be quantitative research, while qualifying phenomena in which the quality of data is emphasised is considered a definition of qualitative research (Bryman & Bell, 2007). Therefore, from these different points of view, it can be seen that each research methodology could be used in pieces of research based on the aim and purpose of that research. However, in a study investigating the status and trends of research methods and data analysis procedures conducted by educational researchers, Hsu (2007) found that since the mid-1980s a continuous decrease in percentages of experimental quantitative research appeared, with a relative rise in non-experimental qualitative research.

It is critical that the general advantages and disadvantages of both approaches are discussed with reference to the research design of the current study. Vanderstoep and Johnston (2008) state that quantitative research is concerned with large samples and statistical validity, and accurately reflects a population, whereas qualitative research relies on in-depth narrative description of a small sample. In respect of the disadvantages of these methods, it is argued that quantitative research provides a superficial understanding of a case subject's thoughts and feelings. In addition, greater attention to issues of transparency should be included among the conventional criteria for surveys (Dale, 2006, cited in Bryman et al., 2007), while the small sample sizes of qualitative research mean that the data are not generalisable to the population at large. Furthermore, "the value of qualitative research has recently come to be questioned again, after many years during which it was widely accepted" (Hammersley, 2007, p. 287).

These research methodologies can also be used in combination with each other, as well as separately, in order to achieve research aims. Gorard and Taylor (2003) and Symonds and Gorard (2010) state that much of the recent substantial research in education, and commonly in social science, uses and advocates the mixed methods approach. Moreover, Bryman, Becker and Sempik (2007), through a view from social policy, found that a mixed method that uses a combination of quantitative and qualitative research criteria is preferred. Onwuegbuzie and Leech (2005, p. 375) also claim that "Mono-method research is the biggest threat to the advancement of the social sciences". However, purist researchers, such as Smith (1983) and Heshusius (1986), advocate mono-method studies and argue that these approaches not only should not but also cannot be mixed (Onwuegbuzie & Leech, 2005).

Scott (2007) argues that the quantitative–qualitative divide in educational research can be resolved by considering three perspectives: pragmatism, false duality and warranty through triangulation. These three perspectives underpin the combining of approaches, known as a mixed method.

3.5 Research Design of Current Study

3.5.1 Chosen Research Methodology

The research paradigm adopted for the current study is interpretivist. This approach seeks to understand and interpret the perceptions and actions of the participants involved in the research from their point of view (Bryman, 2012). This paradigm was used to explore the benefits of CIs for the educational progress and placement of deaf pupils in primary school in SA and the factors that affect these benefits. As mentioned in earlier chapters, the increasing number of deaf children who have CIs is a result of a high rate of deafness and the availability of sophisticated medical

centres and government funding. Therefore, such paradigm was chosen to understand these phenomena, as there is a significant gap in the research investigating the educational progress and placement of these students, despite the number of CI surgeries for deaf children having been significantly increased in recent years in SA.

A surprising data, which is ended up by interpretivist stance (Bryman, 2012), was found by the researcher in this study such as the vast majority of pupils with CIs are educated at either special school or units attached within mainstream school but not in mainstream classroom. Also, this interpretation has been interpreted further and clarified by theories and other related studies in the literature. Hence, in order to address the research questions, this study conducted qualitative research using semi structured for both questionnaire and interviews. Thematic analysis was conducted to investigate the data, and the themes that emerged from the data were extracted. Therefore, analysing the data was conducted using these two approaches. As the nature of this study involved primarily a qualitative approach, but quantitative data were used and analysed in order to explore themes. Further discussion of analysing data conducted in this research will be within 3.8.1 and 3.8.2. Next section, discuss the research design and methods for data collection conducted in this study.

3.5.2 Research Design

Triangulation has been explained as the combination of datasets, so that diverse points of view can be exhibited and the data collected can be elaborated without bias (Olsen, 2004). The mixing of primary data (from parents, teachers and clinicians) and secondary data in this research, helped to validate the argument presented in this study. A mixed methods approach has also assisted in developing a legitimate argument regarding the benefit of CIs for the educational progress and inclusion of

deaf pupils in primary schools in SA. Many previous studies have investigated the impact of CIs only in terms of the medical or empirical point of view (Pisoni et al., 2008). However, in the current study, the participants comprised key adults who are involved in the management and education of child with/without CI: parents of deaf pupils with CIs, parents of deaf pupils without CIs, teachers of pupils with CIs, and clinicians (surgeons, speech therapists and audiologists).

Sequential exploratory design was implemented in this study. As the questionnaire and interview data have been combined in addressing the research questions. First, data were collected through questionnaires containing open- and closed-ended questions and then qualitative data were gathered by conducting interviews. Details of these data collections are provided in the subsequent section.

Methods for Data collection

In accordance with the research aims, a primarily qualitative approach was employed for collecting data from the participants involved in this study. A questionnaire, with a combination of open- and closed-ended questions, and semi-structured interviews were chosen to collect the primary data. Silverman (2011) states that a wide range of different and conflicting activities are covered by qualitative research, so that such research is not being used merely as non-quantitative. An open-format question is where the participant is "free to answer in their content and style", whereas closed questions involve a set of given answers which must be chosen by the respondent (Walliman, 2011, p. 98). Although closed questions are easy to answer and do not require special writing skills, the range of possible answerers is limited (Walliman, 2011). Therefore, a combination of open and closed questions was employed in this research.

Both qualitative and quantitative researchers share assumed characteristics of research; for instance, words as well as numbers are clearly used by quantitative researchers and it is argued that numbers are not absent from qualitative research (Silverman, 2011). In relation to this assumption, Plowright (2011) provides Frameworks for an Integrated Methodology (FraIM), which rejects the traditional contradiction between quantitative and qualitative research. The FraIM is aimed "at supporting the integration of different elements of the research process to ensure the effective and successful study of social and educational phenomena" (Plowright, 2011, p. 3). Bryman et al. (2007) investigated the quality criteria of different types of research from a social policy view and argue that "mixed methods findings need to be integrated and not left as distinct quantitative and qualitative findings" (p. 275).

The justification for using a questionnaire is that the researcher aimed to reach a representative sample, which comprises parents of pupils with/without CIs, and clinicians and teachers at primary schools in Riyadh. It is argued that "a survey is a method of systematically asking people questions and recording their answers to produce information that is difficult or impossible to obtain through observation" (Mowbray & Yoshihama, 2001, p. 142). Therefore, it would have been impossible to have the number of participants that were collected in this study using only interviews without involving questionnaires, due to the high number of participants needed, their different locations in the city and their work and family commitments.

Semi-structured interviews were conducted in order to obtain in-depth data regarding the attributes of successful educational progress and inclusive classrooms. Iinterviews contained structured and semi-structured sections with open questions (Walliman, 2011). Consideration of the school dimension and the role of the educational environment were not included in the questionnaire, which focused on

aspects directly related to CIs. This approach was also taken in order to explore issues that were identified in analysis of the questionnaire data, such as reasons for educating deaf pupils at a deaf school.

3.6 Profile of Participants

3.6.1 Population and Study Sample

With respect to participants involved in the study, a distinction needs to be made between the study population and the population sample. The study population for the current study comprised: parents of deaf pupils with/without CIs who study at hearing impaired units, deaf units and mainstream classrooms in public primary schools, teachers of pupils with CIs in primary schools, and clinicians (surgeon, speech therapists and audiologists) in a cochlear implant centre in Riyadh in Saudi Arabia.

The population sample for the study constituted: All the participants live in Riyadh, the capital city of Saudi Arabia. The selection process regarding the recruitment of participants is outlined below.

Pupils with CIs and their parents and teachers were chosen as participants using convenience sampling. Silverman (2011) argues that one of the characteristics of qualitative research is that cases are chosen because of their convenience or interest. The researcher selected all deaf pupils who have CIs studying at primary school in Riyadh (in mainstream classrooms, hearing impaired units and deaf units). Pupils without CIs and their parents were also chosen using convenience sampling from deaf units/schools in the city. There are six primary schools which have deaf pupils without CIs. Four of these schools were chosen by selecting one from each main area

of Riyadh. For example, one school from the north, one from the east, another from the west and the last school from the south of Riyadh. This was because each area has a different set of people living there in terms of social, economic and education status. The researcher, therefore, needed to take into consideration such aspects that might have an influence on the data that would be collected from the participants so that the data would represent the whole population of the city.

Clinicians were selected based on the use of non-probability purposive sampling. This selection of participants was based on the criteria of meeting the aim of the research and specific characteristics, such as qualifications and experience in the field. Such sample types could serve the objectives of the study based on the clinicians' knowledge, competence and qualifications. Although this sample is not representative of all views of clinicians in the population (Riyadh), it is considered a solid basis for scientific analysis and a rich source of information regarding the field that forms the subject of the study.

It is worth noting another type of selecting samples that is random sampling, in order to highlight the difference between this type of sample and that chosen for this study. A random sample is defined as one where each element in the study community has the same opportunity of being one of the sample members. Selection is made in a non-selective but random manner subject to specified conditions, according to the type of sample, taking into account the heterogeneity and variation in the community (Plowright, 2011).

Riyadh was chosen because it has a significant number of schools and the teachers have substantial experience in dealing with and educating deaf pupils with CIs, as well as rehabilitation centres where children with CIs can be trained. The city also

has the most important centre for cochlear implant surgery in the country and one of the largest and most specialised implantation centres in the world (KSU, 2013).

Explanation of the Terms Used in the Data Collection

Throughout this thesis, the various group of participants are referred to as follows: "PW" is used to refer to the first group of parents, whose children have CIs; "PWO" refers to the parents of children without CIs; "DW" refers to deaf pupils with CIs, "DWO" to deaf pupils without CIs, and "T" refers to the teachers of deaf pupils with CIs; and "C" refers to the clinicians at the hospital (speech therapists and audiologists). These sets of initials are used to denote these groups of participants.

Table (1) below shows that how participants and data collection methods relate to the research questions underpinning this study.

Table 1: Participants according to the research questions in the questionnaire

	Research question	**Research method**	**PW**	**PWO**	**T**	**C**
Main Q1	*Parental decision making process and pre-perceptions of CI outcome.*	*Questionnaire*	✓	✓	*x*	*x*
Main Q2	*The benefit of CIs for educational progress*	*Questionnaire + Interviews with PW+T*	✓	*x*	✓	✓
Main Q3	*Perception and experiences regarding the benefit of CIs for educational placement.*	*Questionnaire + Interviews*	✓	*x*	✓	*x*

The researcher was provided a list with information about all the number and names of primary schools and deaf pupils with/without numbers who could be potentially involved in the study by the General Education Administration Department in Riyadh, (see table 2 and 3 below).

Table 2: Current types and numbers of educational placements for deaf pupils with/without CIs in Riyadh

Types and numbers of educational placement				
Hearing impairment units at mainstream schools	Deaf units at mainstream schools	Deaf schools	Mainstream classroom	Total
9 (52.9%)	4 (23.5%)	2 (11.7%)	2 (11.7%)	17 100%

Table 3: Current potential sample available of deaf pupils with/without CIs in Riyadh

Pupil participants		
Deaf pupils with CIs	Deaf pupils without CIs	Total
68 (40.5%)	100 (59.5%)	168 100%

The number and type of participants who were actually involved in the current study in Riyadh are described in Tables 4– 6.

Table 4: Profile of questionnaire respondents

Participants	Respondents		Total
	Male	Female	
PW	38 (86.4%)	6 (13.6%)	44 (25%)
PWO	50 (88%)	7 (12%)	57 (32.3%)
T	65 (100%)	0 (0.00%)	65 (36.9%)
C	8 (80%)	2 (20%)	10 (5.6%)
Total	161 (91.4%)	15 (8.6%)	176 (100%)

Table 5: Profile of interview respondents

Participants	Respondents		Total
	Male	Female	
PW	10	0	10 (50%)
PWO	---	---	----
T	10	0	10 (50%)
C	---	---	-
Total	20	0	20 (100%)

Table 6: Number of deaf pupils involved in the study

Pupil participants		
Deaf pupils with CIs	Deaf pupils without CIs	Total
44 (43.5%)	57 (56.5%)	101 100%

It is argued that a restriction on and limitation to generalisation could occur due to a small number of participants being involved in a piece of research (Burton et al., 2008). Therefore, the number of participants set by the researcher in this study is considered relatively high compared with other studies that have been conducted in SA (further data regarding these studies are presented in the discussion chapter). The researcher felt that the number of participants (involved in 176 questionnaires and 20 interviews) could provide a large amount of in-depth detail. It is also argued that if 10% of questionnaires are received from participants, a researcher should be pleased due to the very low response rate of questionnaires in general (Plowright, 2011). In this study, 44 out of 68 parents and deaf pupils with CIs returned questionnaires (a 64.7% response rate) and 57 questionnaires from 100 parents and deaf pupils without CIs were collected. Some uncompleted questionnaires (2 PW, 3 PWO and 2T) were received and thus were excluded due to the absence of significant data. However, 3/44 PW and 3/57 PWO questionnaires were missing some data, such as one of the factor items having been left unticked. These data were entered into the Statistical Package for the Social Sciences (SPSS) software program using a Modern Missing Data Treatment, which "estimates summary statistics or statistical models using all available data" (Vanek, 2014, p. 44).

3.6.2 Materials

As mentioned earlier, the researcher was kindly provided with the Saudi National Evaluation System for primary schools by the General Education Administration Department at the Ministry of Education in Riyadh. All the information relating to the number/locations of the schools and deaf students with/without CIs used in the study were also provided by the General Education Administration for Boys in Riyadh. Moreover, the Regulations for Special Needs Institutes and Programmes issued by Ministry of Education were also used in this study.

3.7 Instruments for Data Collection

3.7.1 Questionnaire: Structure and Content

The questionnaires used for collecting data in the current study were developed by the researcher to address the research questions. These questionnaires were designed for different participants (parents of deaf with/without CIs, teachers of deaf pupils with CIs and clinicians). The questionnaire was first written in English and then translated into Arabic. Standard Arabic was used in order to avoid double negatives and abstractions which are often difficult for participants to understand (Mowbray & Yoshihama, 2001).Copies of all questionnaires are provided in the Appendices.

Parents of pupils with CIs: The questionnaire comprised five parts:

Part 1: General Information contained a number of items that relate to the parents and deaf children taking part to obtain background information, as follows:

- Student's age (date of birth)
- Student's study stage
- The hearing grade of the parents
- Whether another member of the family is deaf or hearing impaired

- Rehabilitation programme before joining the school
- The period of time the cochlear implant (microphone and sound processor) is used at school
- Communication approaches at school
- Educational setting
- Parents' qualifications (education level)

Part 2: Questions regarding experiences towards the benefit of cochlear implants upon the Educational progress.

Part 3: Questions educational progress at school by academic report.

Part 4: Questions regarding perceptions towards the benefits of CI upon inclusive education.

Part 5: Questions regarding perceptions towards factors that might affect benefit from cochlear implants.

Parents without CIs: The questionnaire comprised three parts:

Part 1: General Information contained a number of items that relate to the parents and deaf children taking part to obtain background information.

Part 2: Questions regarding parents perceptions towards cochlear implants surgery.

Part 3: Questions regarding educational progress at school by academic report.

Teachers of deaf pupils with CIs: The questionnaire comprised four parts:

Part 1: General Information contained a number of items that relate to the teachers taking part to obtain background information such as educational qualification, years of experience and kind of service training they have received.

Part 2: Questions regarding experiences towards the benefit of cochlear implants upon the Educational progress.

Part 3: Questions regarding perceptions towards the benefits of CI upon inclusive education.

Part 4: Questions regarding perceptions towards factors that might affect benefit from cochlear implants.

Clinicians: The questionnaire comprised three parts:

Part 1: General Information contained a number of items that relate to the clinicians taking part to obtain background information such as educational qualification, training and years of experience.

Part 2: Questions regarding experiences towards the benefit of cochlear implants upon the Educational progress.

Part 3: Questions regarding perceptions towards factors that might affect benefit from cochlear implants.

It is significant to point out that gender was originally one of the elements of the participants' profile information. However, due to difficulties facing the researcher, this study focused on male pupils, rather than both male and female, because the education system in Saudi Arabia segregates boys and girls in different schools. Therefore, the researcher could not have access to all-female schools in order to conduct a wider study. Although the questionnaire could have been distributed to girls' schools by post, the researcher might have needed to visit a school to explain the study instrument or additional data might have been needed by the researcher and it would have been impossible for the researcher to undertake such a visit.

3.7.1.1 How Questionnaires Items Relate to Research Questions

Research Q1: The parental decision-making process regarding whether to have a CI for their deaf child

This question was asked in order to explore the parental decision-making process and perceptions and expectations of PW (parents of deaf pupils with CIs) and PWO (parents of deaf pupils without CIs) who decided to have/not to have CIs regarding the benefit of such surgery for deaf pupils. The question had the aim of exploring the role of these pre-perceptions and expectations upon the decision for both PWs and PWOs. Moreover, the question enquired about the sources of information that PWs relied upon when the decision was made, and for PWOs the reasons for not having CIs for their children.

With respect to PWs, the information resources that were used by parents to inform their decision regarding CIs are the hospital, the internet, relatives who have

experience and the media. These parents were also asked whether they had been made aware of negative outcomes of CIs. Parents were also asked if they were made aware of the range of potential benefits of cochlear implant surgery. The level of parents' expectations of CI outcomes was also explored. It is claimed that parents who have high expectations could enhance their child's outcomes (Hyde et al., 2011). The PWO group were asked their reason(s) for their decision to not have the intervention. Would they have liked to pursue CI intervention but could not due to their ability to make the decision for any reason? If that was the case, this was considered an indication of their support for the surgery. Another reason could be that there is not enough information and awareness provided by the different authorities for parents to be able to make the decision with confidence. It might also be the case that risks to health as consequences of the surgery are considered a reason, even though there is a positive outcome.

Perceptions of the outcomes and benefits that might come with having CIs was also included within this section of the questionnaire, in order to complete the picture of parents of deaf pupils without CIs. All of these issues contribute to an exploration of the benefit of implants for educational progress and inclusive education. For example, by knowing that many parents took decision not to pursue CI surgery, not because CIs are unhelpful but for other reasons, does not diminish the importance of CIs as an intervention.

Research Q2: The Benefit of CIs for child's Educational Progress

To answer the second main research question regarding the benefit of cochlear implants for educational progress, two different approaches were included within the questionnaire. Firstly, open questions asked about the experiences of parents of

pupils with CIs, teachers and clinicians regarding the benefit of CIs for educational progress. These questions were also asked in order to evaluate the current situation concerning the significant number of CIs undertaken in SA in terms of advantages and disadvantages, as well as the benefit of such surgery for deaf pupils for parents of pupils with CIs, teachers and clinicians. Moreover, these questions were asked in order to compare the experience and knowledge of the participants' perspectives with existing scientific research and whether the current situation is positive or negative. Furthermore, this perspective was used to identify the extent of the success of the surgery in terms of a positive impact upon educational progress and inclusive education for deaf pupils, as well as any reasons for not taking advantage from the viewpoint of the parents themselves towards the particular case of their child, so that a specific case could be explored.

Secondly, the Saudi National Assessment of Educational Progress (Ministry of Education, 2013), standardised for use in primary schools, was used in order to identify differences between pupils with/without CIs in terms of educational progress in all subjects. This system was designed to follow-up the skills in all subjects during a school year and is divided into two semesters with four periods of testing: two in each semester. The first period is in the middle of the first semester, the second is at the end of the first semester, the third is in the middle of the second semester, and the last is at the end of the second semester, which is the end of the school year (which was chosen by the researcher to be the period in which to conduct the main study).

During each academic semester, the student evaluation record aims to:

a. Distribute the skills belonging to a subject during the four calendar periods.
b. Follow up a student to establish the extent of his/her mastery of a skill.
c. Place a √ if the student has mastered the skill and a × if s/he has not shown his/her mastery of it.

d. Use written tests, which are one of the most important tools of the evaluation system, in the assessment of the knowledge and skills required along with other evaluation tools, such as oral and practical tests and observation.
e. Assess the range of elements that each subject has in relation to knowledge and skills. This includes the identification of minimum skills, which represent the most basic knowledge of each subject.

At the end of each of the four periods of testing, all pupils are assisted by their teachers in terms of achieving the required skills. Teachers then record the levels of pupils' achievements using specific methods (see Table 7) and issue an academic report that is given to the pupils' parents. The parents of pupils with/without CIs recorded results of this report on questionnaire. Participants were asked to circle the appropriate level of the student and complete this form with respect to their child's educational achievements. The levels in the questionnaire represent the level of the student in the subject (with numbers assigned from 1 to 4).

Table 7: Educational progress based on school academic report

Number	Statement	Student's level
1	The level of the student in mathematics is	1 2 3 4
2	The level of the student in reading and writing is	1 2 3 4
3	The level of the student in religion is	1 2 3 4
4	The level of the student in science is	1 2 3 4
5	The level of the student in social science is	1 2 3 4
6	The level of the student in art is	1 2 3 4
7	The level of the student in physical education is	1 2 3 4

Key: Explanation of level of attainment in table 7:
1-is that the student has mastered all the skills prescribed in the course.
2- is that the student has mastered 66% of the prescribed skills or more, including the minimum required skills.
3-is that the student has mastered at least the minimum required skills.
4- is that the student has not mastered all the minimum required skills.

Table 7 shows the typical layout of school academic reports four times a year sent home to pupils' parents at primary school in Riyadh. It is crucial to point out that the curricula provided for deaf pupils both with and without CIs are the same. However,

there is some adjustment to the skills required for each subject. This adjustment is due to the nature of hearing disability, which has already been taken into consideration within this study (see the data analysis section in this chapter). An illustration of this is that a deaf pupil without a CI would be asked by teachers to master a lower number of the minimum required skills in a subject, whereas a deaf pupil with a CI is required to master the standard minimum required skills. The minimum required skills must be achieved by the pupil in order for him/her to be moved to the next academic year.

Perceptions of Factors that Affect Cochlear Implants

This section of the questionnaire aims to identify factors concerning parents of deaf pupils with CIs, teachers and clinicians, that might be seen as an obstacle for benefits from implants with respect to the educational progress of a student.

A scale of factors (Table 8) was included within the survey based on two approaches: firstly, according to the literature review, different factors were identified that might affect users of CI; secondly, the researcher followed a 'think-aloud strategy' and contacted the most eminent doctor in SA who carries out cochlear surgery for deaf children at a hospital in Riyadh. He was pleased to cooperate and help in terms of developing the pilot study and gathering the main data from clinicians. A meeting was arranged at the hospital, where there is a large group of surgeons and speech and audiology specialists. The researcher gave a presentation of the project and then discussed the possibility of cooperation with the hospital staff.

Table 8: Factors included within the questionnaire

Items	Item number
Age of implantation	1
Early intervention	2
Rehabilitation programmes	3, 4, 10
Family awareness	5, 6, 9
Teamwork	7, 8
Presence of more than one hearing-impaired individual in a family	11
Laws and regulations	12
Using a hearing aid	13
Approaches to communicating with students	14, 15, 16

It was stated by the staff that a Treatment Centre has been established for cochlear implants in Riyadh, conducting between 400 and 600 CI surgical operation a year. Many of factors that were included in the questionnaire in this study that could influence the benefit of CIs were provided by the team at the hospital. It is believed that this step is significant because this contribution comes from the study context and from the most important clinical centre within that community.

In addition, academic reports giving attainment levels for reading, writing and mathematics for pupils with CIs were examined using variables of these pupils and their parents in analysing the data collected for this section. Hence, variables which might affect educational outcomes, such as the parents' hearing status, having more than one member in the family who is deaf, early intervention using a hearing aid for the whole of the school day, and the communication approach, were examined by tabulating the pupils' results in these subjects and these variables. A few questions related directly to CIs were also included, such as when the child's cochlear implant surgery took place and whether the child has a cochlear implant in one ear only or in both (unilateral and bilateral respectively).

Research Q3 *Experiences and Perceptions of the Benefits of Cochlear Implants for Educational Placement*

The benefit of CIs for educational placement is the focus of the third main question in this study. This question was used to explore the benefit of CIs for the educational placement of pupils with CIs. The focus was on exploring the current situation of these pupils' educational settings and the perceptions and experiences of parents and teachers towards the impact of CIs on enhancing inclusive education for these pupils. The role of the environment in educational placement for these students was also considered. In this section, both the quantitative (questionnaire) and qualitative (interviews) data were used in light of the benefits of CIs for the educational placement of deaf pupils in primary schools in Riyadh.

The Current Educational Placement of Deaf Pupils with CIs

The types of educational settings attended by deaf pupils before and after CI surgery were investigated. The status of pupils in the various settings before having CIs and then situations to which they were moved after treatment were also investigated. This investigation had the aim of exploring the current educational settings, as well as the extent of the change that was observed in pupils with CIs and their educational setting after having CI intervention. Parents of deaf pupils with CIs were asked to indicate their child's educational setting from a list of different types of provision. Table 9 shows how the educational settings of deaf pupils before and after having CIs are identified on questionnaire.

Table 9: Educational settings of deaf pupils before and after having CI surgery

Educational setting	**Before CI surgery**	**After CI surgery**
Hearing impaired unit in a mainstream school	------	-----
Hearing impaired unit with part of the day in a mainstream classroom	------	------
Mainstream classroom	.-------	------
Deaf unit with part of the day in a mainstream classroom	-------	-------
Deaf unit in a mainstream school	--------	--------
Deaf school	-------	-------
Surgery before school age	------	------
Total	-------	-------

Perceptions and Experiences of CIs for Enhancing Inclusive Education for Deaf Pupils with CIs

The perceptions and experiences of parents and teachers towards the impact of CIs on enhancing inclusive education for these pupils was explored by 11 closed questions. Parents and teachers of pupils with CIs were asked to circle the number which represented their response to statements based on their experience and perception, ranging from 'Strongly agree' to 'Strongly disagree' on a Likert scale. The scale was graded with the highest score being 5 to the lowest score of 1 (see Appendix for an example of the questionnaire). There were five basic aspects: relationships, independence, participation and competition, student voice and academic ability. These aspects are considered to be factors that could enhance inclusive education. Thus, the aim was to explore to what extent these aspects might be influenced by cochlear implants so that pupils with CIs can be included in

mainstream classrooms. Table 10 shows how these aspects were included within the questionnaire when dealing with the impact of CIs upon inclusive education for deaf pupils with CIs.

Table 10: Aspects relating to impact of CI on inclusive education for deaf pupils

Aspect that could enhance inclusive education for deaf pupils with CIs	**Item number**
Relationships	1
Independence	2, 3
Participation and competition	4, 5, 6
Student voice	7, 8
Academic ability	9, 10, 11

The survey items were generated by the researcher using secondary data and a think-aloud strategy with experts in the field of special education. This study deals with a community context: a City that has a speciality in terms of the number of cochlear implant surgical operation undertaken annually. There is also a very limited number of such studies, either in SA or in the context of another Arabic country. Therefore, the survey items had to be created by the researcher. While following the think-aloud strategy, the researcher met the Head of the Special Education Department and two supervisors at the General Education Administration Department at the Ministry of Education in Riyadh. During this meeting, different aspects that could affect the inclusive education of deaf pupils with CIs were developed and discussed.

3.7.2 Interviews: Structure and Content

In addition to designing questionnaires, interview schedule was developed to gather further in-depth information with ten parents and ten teachers of deaf children with CIs (Table 11). These parents and teachers indicated through the questionnaire that

they would be pleased to be interviewed. Parents and teachers were selected purposively based on the different educational settings of their children in order to cover as many different questions as possible (Table 11). These settings are as follows: a hearing impaired classroom within a mainstream school (five parents), a hearing impaired classroom within a mainstream school and part of the day in a mainstream classroom (two parents), and both a deaf school and a deaf classroom within a mainstream school (three parents). The teachers can be classified as follows: seven teachers were from a hearing impaired classroom within a mainstream school, and three teachers were from both a deaf school and a deaf classroom within a mainstream school.

Table 11: Interview participants (parents and teachers of deaf pupils with CIs)

Educational setting	**Participants regarding pupils with CIs**	
	Parents	**Teachers**
Hearing impaired classroom within a mainstream school	5	7
Hearing impaired classroom within a mainstream school and part of the day in a mainstream classroom	2	-----
Deaf school/deaf classroom within a mainstream school	3	3
Total	**10**	**10**

The researcher returned to the UK after collecting the completed questionnaires in order to analyse the responses, so the one-to-one interviews with participants who were in SA were conducted over the telephone. Walliman (2011, p. 100) states that "telephone interviews avoid the necessity of traveling to the respondents and can therefore be carried out more quickly than face to face". However, visual aids and cues that can explain questions cannot be used through the medium of the telephone.

Mobile telephones were not used extensively because their application is relatively new in conducting research (Plowright, 2011). Each of the interviews took between 20-30 minutes to complete the interview questions. The interviewees were informed of the aim of the research and the topic before giving their consent to participate. There are ethical issues that need to be addressed when recording what participants say during interview (Plowright, 2011). Therefore, the interviews were recorded only with the permission of the participants. Copy of consent form is in Appendix.

A one-to-one interview "offers a personal presence during the data collection which allows you some control over the conditions under which the questions are asked" (Plowright, 2011, p. 83). Therefore, the manner and order of asking the questions and clarifying meaning if any issue was unclear was taken into consideration. For instance, a friendly greeting, an explanation of the interview purposes and listening to and expressing an interest in the participants' responses was practised by the researcher.

The reasons for conducting interviews were as threefold: Firstly, interviews would enable the researcher to obtain in-depth data regarding the attributes of successful educational progress and inclusive classrooms. These attributes were not included within the questionnaire, which investigated aspects related to CI directly. Secondly, the researcher could interview parents of deaf children with CIs who were still studying at a special school or deaf unit and had not moved to either a hearing impaired or mainstream class. In other words, the researcher could ask why they had not gained a benefit from the intervention (CI), in terms of moving from exclusive to inclusive education. Thirdly, the nature of issues referred to above could be clarified and explained by parents and teachers in greater depth during the interviews, than would have been possible in a questionnaire.

3.7.2.1 How Interview Schedule Relates to Research Questions

The interview schedule was developed to address the second and third research questions. Nine semi-structured questions (see Appendix for copy of Interview schedule) investigated parents' and teachers' experiences and perspectives. This investigation is regarding the benefit of CI for the educational progress and educational placements of deaf pupils with CIs after having a CI intervention and factors that could affect such a benefit. Although these issues were included in the questionnaire, the researcher sought more data, as the interviews would allow for both the participants and the researcher to investigate and discuss pertinent issues in greater depth. Moreover, the matter of whether the curriculum that is delivered to pupils with CI should be a special one, was included as an interview question, as well as teachers' role in contributing to enhancing the educational progress, skills and training that these pupils should receive.

With respect to educational placement, the perspectives and experiences of parents and teachers of deaf pupils with CIs, were explored in terms of whether the school currently embraced these pupils. The role of educational environmental support was also discussed, as the school can help such students to be included within a less exclusive education environment. Moreover, an investigation of education in a deaf unit/school was carried out, as some pupils with CIs (n = 11/44; 25%) in this study were being educated in these types of settings. Therefore, making a decision in terms of referring pupils with CIs to particular education programmes was also investigated. During the interviews, the participants were asked about deaf pupils' social relationships and communication with their classmates, in the classroom and the wider school. For instance, was there any disruptive behaviour or bullying and how could these incidents be minimised or avoided altogether?

Interviews questions asked during interviews

Q1: What is your perspective and experience regarding pupil with CI educational progress after having such intervention?

Q2 from your experience what factors that could affect benefit of CI?

Q3 What do you think about curriculum which are delivered to your pupil? Should special curriculum be given? Why?

Q4 Could you please give a brief evaluation regarding to what extent teachers of deaf pupils with CIs contributing in enhancing educational progress? (What skills and training they should have)

Q5 Do you think that school is able to embrace deaf pupil with CIs?

Q6 From your experience why some pupils with CIs are educated at either deaf unites or deaf school?

Q7 How the decision is made in terms of referring pupil with CIs to particular education programme?

Q8 From your experience and perspective how pupil with CIs could be helped to be included within less exclusive education environment (mainstream classroom, impaired hearing classroom in mainstream school)?

Q9 What do you think regarding your child's social relationships and communicating with his colleagues, whether in the classroom or the school? Is there a bad behaviour, bulling for example? How it can be minimized or avoided?

3.8 Data Analysis

Both forms of research instruments, the questionnaires and interview schedule involved collecting quantitative and qualitative data. Therefore, analysing the data was conducted using these two approaches. As mentioned above, the nature of this study involved primarily a qualitative approach, but quantitative data were used and analysed in order to explore themes.

3.8.1 Analysis of Questionnaire Data

Following completion, all the questionnaires were given an ID reference number as follows: parents of deaf pupils with CIs were designated PW01–PW44, that is pupils with CIs; parents of deaf pupils without CIs were categorised PWO01–PWO57, that is pupils without CIs; teachers T01–T65; and clinicians C01–C10. Thematic analysis was conducted to investigate the data, and themes emerging from the data were extracted. The responses to each of the open questions in the questionnaire (qualitative data) were analysed to enable themes to be identified for each questionnaire item. Braun and Clarke (2006) regard "Thematic analysis as a useful and flexible method for qualitative research" (p. 77) and it should be seen "as a foundational method for qualitative analysis" (p. 78). Thus, a rich and detailed account of data provided by a flexible and useful research tool can be delivered by thematic analysis (Braun & Clarke, 2006). Such flexibility is considered as an advantage of this analysis approach. However, although generic activities of qualitative data analyses are used, such data can be analysed from a variety of angles (Kuzborska, 2014).

The analysis of data requires coding the information. Two different approaches to coding are highlighted here: first, Mackey and Gass (2005, p. 241) state that "the schemes for quantitative coding generally emerge from the data rather than being decided on and pre-imposed prior to the data being collected or coded"; and second, a coding scheme can be developed by researchers in accordance with their research questions (Mackey & Gass, 2005). Furthermore, there are three steps in a coding process: pre-coding, initial coding and second-level coding (Kuzborska, 2014). This study followed these three steps. First, all the open questions were transcribed in Arabic in order to reflect the actual meanings and concepts in the participants' own

language before translating them into English. Creswell (2003, p. 192) describes this process as "taking text data or images into categories, and labelling those categories with a term, often a term based in the actual language of the participant". After that a translation from Arabic into English was carried out for all the transcripts, rather than only translating themes and categories. The answers to each of the open questions were listed for all the teachers on one sheet, all the answers given by the parents were listed on another sheet, and so on.

The pre-coding process is defined as the reading and re-reading of transcripts in order to make sense of first impressions of data and reflect upon research thinking about the data (Dornyel, 2007). Initial coding is used to highlight the text relevant to the study topic and to add informative labels in the margins (Dornyel, 2007). With respect to the third step, that of second-level coding, this aims not only to describe the labels, but also to go beyond and extract ideas and patterns from individual respondents' answers (Dornyel, 2007).

In relation to the open-ended questions (which employed a Likert scale), the Statistical Package for the Social Sciences (SPSS) software programme was used to identify frequencies and to compare the means. Walliman (2011) states that computer software packages such as SPSS can be used to statistically analyse the data and make presentations of the results in a research study. The participants were asked, based on their experience, to circle the number which represented their response to the statements listed (ranging from 'Strongly agree' to 'Strongly disagree'). The scale was graded from the highest point receiving 5 marks to the lowest receiving 1. These data were analysed by combining the 'Strongly agree' with the 'Agree' responses, and the 'Strongly disagree' with the 'Disagree' answers. The percentages of participants' responses for each item were presented.

Cross tabulations were used in order to identify the relationships between the different variables and the educational progress of pupils with CIs (see Tables 90, 91 Results chapter). Silverman (2011, p. 5) argues that in qualitative research, "Where numbers are used, these are usually in the form of simple tabulations designed to identify deviant cases and do not lead to statistical correlations or test". A Chi-squared test was used in order to examine the statistical significance between the academic results of deaf pupils with and without CIs. Factor analysis was also used in order to identify themes amongst the items from answers to the closed questions and to explore to what extent these items could be related to each other and thus be treated as a group of factors. It has been stated that factor analysis can be used to identity the link between different items that could be treated as a group that represents a unidimensional factor (Kyriacou, 2014). Findings pertaining to the questionnaires are related and discussed in chapter 5 and 6 respectively.

3.8.2 Analysis of Interview Data

Given the nature of qualitative data, transcriptions of the responses to each of the questions in the semi-structured interviews were made and analysed in order to enable themes to be identified for each question. All the interviewees were given an ID reference number as follows: parents of deaf children with CIs were designated PW01–PW10 and teachers T01–T10. The answers to the questions given by all the parents were listed on one sheet, all the answers by teachers were listed on another, and so on. Thematic analysis was conducted to investigate the data, and the themes that emerged from the interview data were extracted (Braun & Clarke,2006).

It is worth pointing out that, as the interviews were conducted in Arabic, the researcher transcribed these interview data into Arabic and then translated them into

English. All the steps in the coding process that were followed for the open questions in the questionnaires were also conducted for the analysis of the interviews.

3.9 Validity and Reliability

Validity refers to the extent to which a result is accurate and whether the actual state of affairs is adequately captured (Robson, 2002). An estimate of reliability is defined as an evaluation of the stability of measures managed at diverse times to the same participants or implementing the same standard, or "the equivalence of sets of items from the same test (internal consistency)" (Kimberlin & Winterstein, 2008, p. 277). Thus, as the data were collected from parents, teachers and clinicians, internal consistency was estimated by the reliability of the equivalence of the sets of questions by the same participants that measured the same perception. In addition to participants' feedback regarding the reliability of the questionnaire items, the inclusive education and factors sections involved scales. It was important to find scales that would be reliable in terms of internal consistency, as "This refers to the degree to which the items that make up the scale hang together" (Pallant, 2010, p. 97).

Therefore, Cronbach's alpha coefficient was used to test the internal consistency of the scales. Devellis (2003) states that the results of this test should be above 0.7 in order to be deemed reliable. The reliability of the factors that affect the scale of the benefit of CI (16 items) using Cronbach's alpha coefficient was 0.718. With respect to the scale for the impact of CI upon enhancing the inclusive education of deaf pupils with CIs (11 items), the Cronbach's alpha coefficient was 0.843.Thus, the reliability test indicates that both the factors and inclusive education scales are deemed reliable.

The research questionnaires (parents with pupils with/without CIs, teachers and clinicians) were validated by participants who have significant experience in this project area, and included experts in special education, the parents of deaf pupils who have had CIs for a long time, and clinicians who perform CI surgery. As an illustration of this validation, two supervisors at the General Education Administration Department in Riyadh examined the questionnaire in terms of its structure and content from the viewpoint of their experience in supervising schools at which deaf pupils with/without CIs study (see Appendix for a copy of the approval of the study from the General Education Administration Department in Riyadh). This assessment was also based on their involvement in the field and because of the up-to-date knowledge of the education outcomes of deaf students that is provided to them due to their professional positions. One expert teacher commented:

Good questionnaire which tells the reality and the importance of creating a guide to make better use of the cochlear implant. This study consists of procedural steps to improve the reality on the ground for enhancing educational outcomes of deaf pupils with a cochlear implant.

Clinicians were also given the instruments to evaluate them in terms of the section regarding factors that affect CIs. This happened twice: before and after composing this section of the questionnaire. The researcher met the clinicians before writing the items regarding factors that might promote or reduce the benefits of CIs so that experts in the same field and environment in which this study was conducted could highlight these factors. Their feedback was involved within this section in particular, such as adding items to the factors regarding the presence of more than one deaf member in the family. The questionnaire was again given to them during the pilot study. One clinician stated that it was a "Good questionnaire and it has a comprehensive focus on the theoretical and practical side". Another clinician

commented that “It is good because it focuses on one aspect (deaf children with CI education) for which there is a big gap in the research”.

Parents played a substantial role in validating the research instrument in terms of adding specific items that relate to the research topic. More details regarding participants’ feedback are included in the section regarding changes to the instrument (see section 3.12). It is important to point out that as the language of the research context is Arabic, accuracy was checked with another native-Arabic speaker who is fluent in English after the research instrument were translated from English into Arabic.

Ultimately, this research is also concerned with social and educational issues that are related to human behaviour, and it is claimed that social pressures in the research context might act as social threats to the validity of the research (Trochim, 2006). According to Trochim (2006) factors that could have an impact on the results include the following:

1. Hypothesis guessing: when participants provide responses based on what they assume the research to be about. As a result, the findings are not only a consequence of the research questions, but also the participants’ reactions to the researcher and his or her study.

2. Evaluator apprehension: when participants are anxious about the subject being studied to the point that the conclusions might be influenced. Therefore, responses do not necessarily reflect accurate information.

3. Experimenter expectancies: when the participants’ responses are shaped by the researcher’s reactions.

3.10 Ethical Issues

Ritchie and Lewis (2003) point out that anonymity, confidentiality and protecting participants and researchers from harm must be taken into account while conducting research. Collis and Hussey (2009) have also emphasised different ethical issues that need to be addressed by the researcher. In regard to this research, the ethical procedures established by the University of York's Department of Education and Information Policy were also taken into consideration and a copy of the approved ethical application is attached in the Appendix. Moreover, two letters were issued by the Saudi Embassy in London: one for the General Education Administration Department in Riyadh and the other for the hospital that was involved in this study. Subsequently, written permission to conduct the study from the General Education Administration Department in Riyadh was delivered to the researcher (see Appendix).

All the participants were briefed in detail that this study was being conducted strictly for academic purposes and that the identity of the participants would be protected. It is believed that participants should not be forced to participate in research. Therefore, the participants were also told that they could leave at any time for any reason without having to give an explanation. Above all, the respondents were made fully aware of the aim of the research and how the data will be used (the consent forms are included in the Appendix). All resources used have been referenced appropriately and only authentic sources have been utilised. The data were also stored appropriately and protected against unauthorised use, damage or loss.

3.11 Pilot Study

It is recommended that research questions should be piloted (Robson, 2002), because this provides a valuable opportunity to examine the clarity of the questions and the design of the way in which they are presented (that is, on paper, electronically or verbally). In addition, some questions that might be ambiguous or unclear can be piloted, in order to verify whether they are appropriate. According to Walliman (2011, p. 98), "it is a common practice to pre-test the questionnaire on a small number of people before it is used in earnest". Therefore, a pilot study for this research was important for the following reasons: Firstly: The research instrument could be piloted by potential research participants so that the researcher could gain feedback about items and content. Bryman and Bell (2001) argue that the language used in the research instrument must be completely understandable for the participants so that they can answer in the most efficient manner. Secondly: To enable the researcher to make an appropriate decision regarding some of the participants as to whether they will be involved in the research. Thirdly: The validity of the instruments could be tested by supervisors with more than 15 years' experience of working with deaf pupils, parents of children with CIs, and clinicians.

However, there were two major constraints faced by the researcher during the course of the pilot study. One of them was the gender of the pupils, teachers and parents (fathers only) who were involved, as only males were chosen. This was due to difficulty in gaining access to female schools, as discussed previously in this chapter. The second constraint was due to the lack of previous research in this area in Saudi Arabia, which means that the findings cannot be compared with published studies.

3.12 Amendments to Data Collection Instruments

It is important to point out that changes following the pilot study were made to the questionnaires, both to the structure of its sections and to its content. In respect of the structure of the sections, the different parts of the questionnaire were re-ordered based on the research questions, starting with general information, then moving to the parental decision process of having CIs for deaf pupils with/without CIs, the benefit of CIs for the educational progress of deaf pupils in primary school in SA (an educational progress scale applied to just the parent participants) and perspectives regarding the factors, followed by the benefit of CIs for the educational placement of deaf pupils with CIs in primary school in SA.

One section of the questionnaire regarding services that are provided within the school was excluded, because of an overlap with some items that already existed within the inclusive education and factors sections. The study was not aiming to investigate these services as the main issue, so it was felt that there was no need for these to be involved as a section. Moreover, open questions relating to friendships, bullying and behaviour in class/school were created within the inclusive education section and within the interview questions. Some items were removed and others added based on participants' feedback. Examples of these adjustments are as follows:

- Items 1 and 2 (factors scale): early discovery and early implants were initially in one item and were then separated into two, so the item became:

  'Age of cochlear implant surgery strongly affects the benefit a student gets from it educationally'.

- Early discovery of hearing impairment strongly affects the benefit a student gains from cochlear implant surgery.

- Item 6 (factors scale): the student and his parents have a clear idea about the type and means of obtaining deaf rehabilitation and speech training services offered by schools or rehabilitation centres.

The participants suggested that within Item 6, it should be mentioned whether this is before the implant, during or after. Therefore, a sentence about after implantation was added, as well as hearing degree after the surgery and the qualifications of parents and teachers.

Further issues were mentioned by participants within the pilot study and were then added by the researcher to the interview questions to be used in the investigation. These issues related to pupils who have cochlear implants but who still study in deaf units, and the suggestion that teachers who work in mainstream classrooms (who are not specialists) must be trained in terms of the needs of those who are hearing impaired.

A pilot study was undertaken and will be discussed in the following chapter (chapter 4).

Chapter 4: Pilot Study

4.1 Overview of Data

As mentioned in chapter 3 (Methodology), the aim of the current research study, is to explore the benefits of cochlear implants upon the educational progress and inclusive education for deaf pupils at primary school in Saudi Arabia. This chapter examines the findings of the data that were collected for the pilot study within the context of the research aims. Key responses from the questionnaires, both quantitative and qualitative, will be supported by extracts from the literature in order to investigate issues related to the research questions of this study, namely:

Research Question 1:

What is the parental decision-making process regarding whether to have a CI for their deaf child?

1a. what are the perceptions and expectations of parents prior to deciding to have/not to have CI surgery for their child?

Research Questions 2:

What are the benefits of CIs for the educational progress of deaf pupils in primary school in SA?

2a. what are the post-CI surgery experiences of parents, teachers and clinicians regarding the benefit of CIs for the educational progress of deaf pupils with CIs?

2b. what are the differences between deaf pupils with/without cochlear implants in their educational progress based on school academic results?

2c. what are the participants' perceptions of experiences towards factors affecting the educational progress of deaf pupils with CIs?

Research Question 3:

To what extent does CI surgery affect educational placement of deaf pupils at primary schools in SA?

3a. what are the current types of educational setting for pupils who have CIs in primary school in Riyadh?

3b. what are participants' experiences towards the impact of CIs on enhancing inclusive education for deaf pupils with CIs?

3c. what are the perceptions and experiences regarding the role of the educational environment upon inclusive education for deaf pupils with CIs?

This chapter will attempt to address these questions, and any associated topics, through the use of data collected from the literature and the practical investigation. The perception of parents of profoundly deaf pupils with/without cochlear implants, teachers and clinicians regarding cochlear implant surgery will be discussed first, covering a variety of related themes. After that, the impact of cochlear implants upon educational progress for deaf pupils will be investigated in two ways: first, through the perception of the parents and teachers of deaf pupils with CIs; second, by identifying any differences between deaf pupils with/without CIs in their educational progress based on school academic reports. Then, the perception and experiences of the parents and teachers of profoundly deaf pupils with CIs regarding inclusive education for those pupils will be presented.

This leads to a discussion of the ability that deaf pupils with CIs could have in order to be included within mainstream classrooms rather than special units at school. Finally, factors that could either reduce or promote the benefits of cochlear implants will be highlighted by the perspectives of parents, teachers and clinicians. The

analysis of the data led to the emergence of four main categories in relation to the benefits of CIs upon the educational progress and inclusive education:

- The advantages and disadvantages of CIs.
- The benefits upon educational progress.
- The benefits upon inclusive education.
- The factors that affect successful outcome of CIs.

4.1.1 Pilot Study Participants

The study population of the pilot study comprised: parents of deaf pupils with/without CIs who study at hearing impaired units, deaf units and mainstream classrooms in public primary schools, teachers of pupils with CIs in primary schools, and clinicians (speech therapists and audiologists) in cochlear implant centres in Saudi Arabia. Table 12 and 13 show the number and where they are based.

Table 12: The categories and number of participants involved in the study

Participants	**Number**
Parents of pupils with cochlear implants	4 + 1 excluded because the instrument was not completed
Parents of pupils without cochlear implants	3 + 1 excluded because the instrument was not completed
Teachers	10 (2 of whom also work as supervisors)
Clinicians	9
Total	**26**

Table 13: Number of participants and where they are based

Place	Mainstream classroom	Hearing units attached to a mainstream school	Deaf units attached to a mainstream school	Hospital	**Total**
Number of participants	1 parent	3 parents + 10 teachers	3 parents	9 clinicians	**26**
Number of places	1	2	2	2	**7**

Population sample: all the participants live in Riyadh, the capital city of Saudi Arabia. The number of participants has been chosen as follows.

The pupils with CIs and their parents and teachers participants were chosen randomly (cluster sampling) from within the research population. A random sample is defined as one where each element in the study community has an opportunity to be one of the sample members. A random sample of different types is selected when the study population is specific and known in terms of geographical boundaries and number. Selection is made in a non-selective but random manner subject to specified conditions, according to the type of sample, taking into account the heterogeneity and variation in the community (Plowright, 2011).

Clinicians were selected based on the use of non-probability purposive sampling. This selection of participants is based on the criteria of meeting the aim of the research and specific characteristics such as a qualification and experience in the same field. Such kinds of sample types could serve the objectives of the study based on the clinicians' knowledge and their competence and qualifications. Although this sample is not representative of all views of clinicians in the population, it is considered a solid basis for scientific analysis and a rich source of information regarding the field that forms the subject of the study.

4.1.2 Procedures for Collection Data

The researcher contacted the Head of the Special Education Department in Riyadh in order to arrange meetings with the Principals of the schools. Meetings were then arranged and research instruments provided by the researcher to the Principals in order for the questionnaires to be distributed to parents and teachers. These parents and teachers were selected randomly within number of school that are provided to the researcher. Then, school number two and five from Hearing impaired units at schools were selected randomly. Three and four from Deaf units at schools were chosen. The mainstream classroom was just one participant. Questionnaires were distributed to the three principals of the schools who were met in person by the researcher, whereas the other two schools were contacted by telephone and email. The purpose of the project and all parts of the questionnaire were explained and highlighted to the principals, who then followed the same process with the parents and teachers.

The clinicians, speech therapists and audiologists were selected from two hospitals. The clinicians were chosen within these hospitals. A visit to Hospital, where cochlear implants are conducted, was made by the researcher in order to explain and answer any questions regarding the questionnaire. All the questionnaires were then collected from all the participants, either in person (hard copy) or electronically via email.

4.1.3 Explanation of Terms used in Questionnaires

In the coding of the four response groups from the questionnaires, “PW” is used to refer to the first group of parents, whose children have CIs; “PWO” refers to the parents of children without CIs; DW refer to deaf pupils with CI, whereas DWO refer to deaf pupils without CI,“T” refers to the teachers of deaf pupils with CIs; and

"C" refers to the clinicians at the hospital (speech therapists and audiologists). These sets of initials will occasionally be used in this chapter.

4.1.4 Analysis of Pilot Study Data

The research instruments utilises mixed methods, involving quantitative and qualitative data. Therefore, analysing the data were conducted using these two approaches.

First, for the qualitative data, all the questionnaires were given an ID reference as follows: Parents of deaf children with CIs will be designated PW00 – PW 04, parents of deaf without CIs PWO 00- PWO 03; teachers T00 – T10 and clinicians C00/C09. Then, the answers to each of the open questions in the questionnaire were analysed to enable themes to be identified for each questionnaire item. For example, the perceptions on CI surgery answers have been listed for all teachers on one sheet and then for this question all the answers by parents were listed on another sheet, and so on.

Second, the Statistical Package for the Social Sciences (SPSS) software programme was used to analyse the quantitative data. See findings in this chapter.

Translation of questionnaires from Arabic to English has been checked with another native Arabic speaker who fluent in English.

4.1.5 Clarification of Core Issues Underpinning Research

Before exploring the findings in depth, clarification is required on the co-operation between the schools and parents and also between the schools and rehabilitation centres from the other side in terms of enhancing parents' awareness and making the

decision of having a CI. These issues have been raised because they might be dilemmas that could affect CI outcomes regardless of the availability of basic requirements related to CIs.

Regarding the lack of cooperation, parents, teachers and clinicians agreed that the cooperation between schools and parents is somewhat lacking. Rehabilitation centres and parents also have the same situation. One clinician claimed that "*special needs services might be the weakest link in this regard*". Such co-operation was indicated by participants in this study as one of the important factors that could affect CIs outcomes.

Regarding the decision to have a CI and who would make this critical choice, the parents of pupils with CI were asked whether they are made aware of potential benefits of the surgery and 75% (n=3) of them responded "No". This could affect the decision maker negatively and he or she might refuse to obtain such an improvement, which could be very significant for deaf children. However, it is worth pointing out that the number of parents of deaf with CIs who was involved in the pilot study were limited. Thus, at the main study that is with wide number of participants, results of such issue could be more reliable.

In this regard, parents also stated that some fathers refuse to take the decision due to their lack of knowledge, as they are not educated enough. Thus, it could be suggested that the health authorities could take responsibility for playing a substantial role in order to make parents aware of the advantages that could be provided by CIs for deaf children.

4.2 Perceptions Regarding CI Surgery

This section will highlight the responses which have been given by all participants who are involved in this pilot study. The PW, PWO, T and C groups were involved in investigating the perceptions in relation to CI surgery. Advantages and disadvantages of CI are discussed by different groups in order to draw a picture of the current situation of CIs based on experiences and evaluate this situation to the scientific researches either positively or negatively. Moreover, to find out participants' position and attitudes towards the CIs that might have affect their expectations. Such expectations are given less intention in resent research studies comparison to the focus on spoken language of deaf with CIs (Marschark,2003).

However, although the advantages of CIs are presented by the participants, such advantages are conditioned by specific requirements in order to be effective. This section will discuss different themes that were extracted from the participants (PW, T and C groups) regarding such advantages. Before starting with the advantages and disadvantages of CIs that are given by PW,T and C, the prospection of PWO group will be discussed first.

In respect to the PWO group perceptions towards CI surgery, as mentioned in the previous chapter, it is crucial to investigate why parents of deaf pupils without CIs do not make the decision to have one. They might like to have proceeded but could not due to their ability for any reason. If this is the case, this is considered an indication of their support for the surgery, or there is not enough information and awareness that could be provided by different authorities to be relied upon in order to make the decision. In addition, if risks to health are considered consequences of the surgery, this is treated as a reason even though there is a positive outcome. Expectations of

the results of having cochlear implants in terms of educational and language outcomes were also included within this part, in order to complete the whole picture of parents of deaf pupils without CIs.

In respect to the PWO response regarding the CIs surgery, it can be seen that all participants (n=3) stated that the risks to health as a consequence of the surgery were considered as a reason for not taking the decision of having CIs for their children. Information and awareness that could have been provided by different authorities are also not enough to be relied upon in order to make such a decision. Therefore, it could be argued that if there is a significant role that could be played by different authorities, such as government ministries, private associations and the media, there might be another perception of parents towards their children having CIs.

Regarding the expectations of outcomes from having cochlear implants, 66% (n=2) of the PWO category indicated that there is a low expectation of the outcomes possible from having cochlear implants in terms of education and language, whereas 33% (n=1) stated that their expectations are not at a low level. Here, the awareness of parents about CIs and their benefits and procedures could also promote or reduce expectations regarding the outcomes of CIs. The majority of the PWO group indicated that there is not enough information to be relied upon in order to make the decision and, at the same time, those participants stated that their expectations are low in terms of positive outcomes.

4.2.1 Advantages of CIs

4.2.1.1 CI is a Significant Treatment

It was stated by the PW, T and C groups that a CI is considered as a good alternative for a deaf child, as it has significant advantages that could help the child. One parent stated, "*Thank God, it is a positive, and good enough*".

However, these advantages should be placed alongside the support of rehabilitation programmes and the effect of the school environment. One teacher highlighted that "*It is one of the good alternatives for the deaf, but they need to be supported by the process of rehabilitative aspects and learning environment*". Moreover, the parents', the school's, and the health sector's role in enhancing the advantages of CI is stated in one parent's view, as it was claimed that the "*advantages are significant if the student is provided support by school, parents, health government sector and rehabilitation and training centres*".

It seems that most of the participants had a clear positive trend towards the advantages of CIs but also that they were not satisfied with the support services that could be provided in order to enhance the benefit of CIs. As one parent reported: "*Excellent. But rehabilitation which is given by hospital is less than the required level*". Nevertheless, there was a different response regarding CI surgery, as the experience of parents was negative. One parent stated that "*the advantage of CI is nothing!*"

4.2.1.2 Reducing Hearing Loss and Improving Speech

Seven of the nine (88%) clinicians (speech therapists and audiologists) claimed that CIs have a substantial role in reducing hearing loss and improving speech. One

clinician highlighted that "*CI resolves deaf problems and let them listen*"; another stated "*it helps a deaf child in order to overcome poor speech*". The parents had the same indication, as one parent felt that "*the most important thing about a CI is improving a pupil's speech*". Teachers also agreed about the reduction of hearing loss and improved speech that could be a result of having a CI. One teacher indicated, "*I feel that CI reduces hearing loss*". Others remarked, "*It improves hearing*", and "*CI increases the linguistic output*".

4.2.1.3 Improving Learning and Academic Achievement

It seems that a CI could contribute to a deaf child's educational level. One teacher reported that "*it had a significant impact in the evolution of the level of students who find full attention and follow-up*". One clinician argued that "*Learning language and speech, which are enhanced by a CI, allow the deaf to learn and thus enrich their knowledge*". One teacher also highlighted that "*An increase in deaf pupils' academic achievement is very obvious to me*".

It is important to mention here that there was no contrasting argument about whether a CI has a negative impact upon the educational progress of a deaf child.

4.2.1.4 Inclusive Education

Inclusive education for deaf pupils who have a CI is one of the main themes that were indicated by the participants (PW, T and C groups). From the teachers' perspective, it can be seen that a CI might influence a pupil's inclusivity at mainstream school. One teacher stated that a "*CI effectively helps to integrate a deaf pupil with his ordinary peers*". It is crucial to highlight that this teacher used "integrate" rather than "include". The former term indicates that pupils who are

defined as having special educational needs (SEN) could be within a mainstream school physically but educated in a private classroom attached to a public school. The latter term, "inclusion", refers to SEN pupils who could be included within a mainstream classroom and have the full potential for communication and interaction with their peers.

Moreover, another teacher was in favour of CI advantages in enhancing inclusion rather than integration. It was argued that a child who is "*deaf with a CI can be included within a mainstream classroom*".

4.2.1.5 Enhancing Communication and Self-confidence

Communication with deaf pupils is considered an aspect that might be improved and developed using CIs. The teachers claimed that using a CI could help a deaf pupil to be able to communicate with the surrounding environment. Teachers stated that this will "*help students to communicate with their hearing peers*", and that a student can "*communicate better orally*". A clinician also stated that "*it helps communication*".

Regarding self-confidence, it was argued that CIs could have a positive impact on enhancing the communication skills of deaf pupils and, as a result, self-confidence might also be one of the advantages. One teacher commented: "*I would say that a CI helps developing self-confidence for a deaf pupil*", and a deaf child is "*able to communicate effectively with those around him*".

4.2.1.6 Lifestyle

Lifestyle was indicated by the participants as one of the advantages of CIs. One participant commented that they "*benefit the life of a student who has a cochlear implant*". Another participant was clearer about which aspect of life could be

influenced by a CI. It was claimed that "*he/she can use modern technical devices such as a mobile phone to communicate*". Clinicians stated that a CI has a significant impact upon a deaf child's life. One clinician stated that a "*CI changes life from a child who cannot completely hear into one who could hear and express him/herself so their life is positively influenced*". It was also stated that CIs stimulate mental and human energy resources for the deaf, which is reflected positively in their lives.

4.2.2 Disadvantages of CIs

This section will highlight participants' responses regarding the disadvantages of CIs. These disadvantages are indicated in two ways: either in terms of the CI itself, or issues associated with it. It is worth mentioning that 33% (n=3) of the clinicians asked did not indicate any disadvantages, whereas all the parents did, as well as 90% of the teachers. This might be due to clinicians in favour of such treatments as it is provided mainly by hospitals. Pisoni et.al, (2009) claim that documenting the efficacy of CIs as a medical treatment for profound deafness are primarily interested to clinicians such as speech therapists and audiologists.

4.2.2.1 Health Risk

The health risk is considered the most important issue in terms of the disadvantages of a CI. If the clinicians' responses are taken first, it can be seen that different aspects of health are mentioned. For instance, it was stated that "*It is ultimately a surgery and when the operation takes place for the child, he/she must have follow-up hospital, education, training, etc.., it's one way!*" Another stated that "*It is very hard for parents and the child as well because such surgery takes a long procedure to be carried out*". Parents also showed their fears about this surgery, as one parent

commented, "*My wife and I are suffering because the child is very young to cope with such a situation*". It was also stated by one parent that the "*only fear is about my child's health*". However, one parent had a very extreme position, when it was stated that a "*CI is very bad!*"

4.2.2.2 External Appearance and High Level of Expense

A CI has a unique shape so that it can be placed on a child's head and ear. Thus, there are consequences that were mentioned by the participants regarding the external appearance of the child. Parents and clinicians focused on external appearance. As one clinician stated, a "*child might be worried about his/her external appearance*". Another also stated that the "*community stigma might have a negative impact on the child and family*". One issue that was raised by teachers was that a hearing aid usually falls out as a consequence of a child's movements. It was claimed that "*students' movement and the nature of their actions may lead a hearing aid to fall out frequently*".

With respect to the cost of surgery, it was claimed that such an operation costs a significant amount and this could affect the benefit of the CI. One parent argued that the "*training services after the surgery are very expensive so we could not afford it*". Clinicians and teachers also argued that there are financial difficulties associated with CI surgery.

4.2.2.3 Late Implantation

One parent commented about the disadvantages of late implantation: "*I hope to get it done at the age of 10 months. I saw a child who had it at this age and the results were excellent*". Moreover, it was argued that "*Delays in the cochlear implant to*

advanced stages of age might have a negative impact". Another argued that "*If surgery takes place at a late age in a child's life, there will be disadvantages*". It seems that all the participants agreed that a CI could have disadvantages if it is implanted at an older age.

4.2.2.4 Technology Issues

CIs, as with other electronic devices, are constantly evolving, just as computers and mobile phones are constantly being updated. A CI is implanted into a deaf child's brain, so deaf pupils will have to update this cochlear implant constantly as well as the external device. One teacher stated:

> *Technology is constantly evolving and sooner or later device manufacturing companies will develop newer devices. In both cases, when a deaf child needs to update the device or search for parts he/she will not find them on the market or the implanted device is too old and parts are no longer made for it.*

Another teacher commented: "*When it has any failure of any part of it, it has to be replaced and this is the problem!"* Therefore, it seems that there is an issue in respect of the device itself and here it was believed that the hospital and the school should play a substantial role in order to support parents and make them aware about the devices available from companies and what negative issues might accompany such surgery. For example, one parent argued that "*Dealing with an unknown cochlear company might be dangerous, I hope to focus more on successful companies for cochlear such as Nicholas and Clarion*".

Moreover, it was claimed that the "*sound of hearing aids needs to be modified frequently*". Thus, parents need to be aware of the appropriate quality and the mechanics of the continuous development of the implanted device so it will not affect the child's condition or cause him/her future problems.

4.2.2.5 Lack of Qualified Professionals in Saudi

It seems that a lack of professionals who could deal with and train deaf children with a CI might be one of the disadvantages associated with CIs. All the participants (PW, T and C group) indicated that this dilemma could hinder the benefit of CIs. However, each group of participants took a different point of view regarding this issue. For example, one parent reported that "*There is no speech therapy and auditory training at mainstream schools and centres*". This means that the case is not just a lack but also an absence of such professionals. Moreover, one parent commented on the "*Lack of rehabilitation in the Arabic world as there are no qualified professionals*". One of the teachers, however, argued that a "*Student is not given an integrated training programme that is with the home, school and doctor*". This suggests that the case is that of a lack of cooperation between professionals, rather than a lack of personnel. Training equipment might also be a problem facing teachers in schools. It was reported that there was "*The lack of an environment equipped at school so pupils could be trained after the cochlear is implanted*".

The clinicians stated that schools and rehabilitation centres suffer from a lack of qualified people. This leads to the discussion in the next section of the lack of rehabilitation services as a disadvantage of CIs.

4.2.2.6 Lack of Rehabilitation Services

The lack of rehabilitation services might be the most important dilemma that could affect the benefits of CIs because this was mentioned by 75% (n= 3)of the parents, 90% (n=9) of the teachers, and 88% (n=8) of the clinicians who took part. As mentioned earlier, it seems that no dissatisfaction was shown by participants in terms of the rehabilitation services in Saudi Arabia. This satisfaction might be in terms of

the high costs, the quality of training, the professionals and the availability of such services.

One teacher indicated: "*I would say there would be many disadvantages, if it was a lack of rehabilitation and care of parents, schools and the Ministry of Education*". It was also claimed that "*It is undoubted that there is a lack of appropriate and adequate rehabilitation*".

One clinician argued that "*rehabilitation services should play a significant role in helping deaf children and their families, for example in terms of early intervention programmes but unfortunately there is a clear gap in this issue*".

4.2.2.7 Lack of Family Awareness

This disadvantage was only stated by teachers and clinicians. It seems that the clinicians and teachers claimed that without the parents' awareness and cooperation, there would not be any benefit and improvement in a deaf pupil's education. It was mentioned that "*There might be disadvantages as a result of a lack of good follow-up with the student and if the family relies entirely on the school*".

One teacher also claimed that there was a "*Serious disadvantage, if students still rely on sign language because their family is not aware of how should they contact with him/her".*

One clinician also highlighted the importance of family awareness, as it was argued that the "*Family could make a significant contribution in enhancing the benefit of CI, otherwise a deaf child would not gain any benefit even though the child continues to get rehabilitation courses!*"

Moreover, one teacher, based on his experience, mentioned an issue that was usually faced with his pupils at school. He stated that the "*Family neglects the child's hearing aid and there is a lack of maintenance*".

Therefore, a lack of awareness and a lack of the necessary specialist training to deal with CIs and methods of interaction with a CI in the family home might be a core issue that should be taken into consideration by different authorities.

4.3 Benefits of CIs upon Educational Progress for Deaf Pupils

The benefits of CIs upon the educational progress for deaf pupils were investigated in two ways. First (Research question1), the perspectives of the parents of deaf pupils with a CI, teachers and clinicians regarding the impact of CIs upon the educational progress will be presented. Second, the results of pupils with/without CIs in various subjects will be highlighted based on the academic school reports. At the end, a discussion of the findings of both approaches will be conducted.

A demographic profile of the pupils will be provided, then the overall outcomes of the subjects will be mentioned. In addition, any differences between pupils with/without CIs in terms of their educational progress will be highlighted and, if this was the case, in which kind of subject.

4.3.1 Profile of Participants

The pupils who were involved in the pilot study were divided into two groups. From Table 14, the frequency and percentage of each group can be seen.

Table 14: Frequency and percentage of pupils with/without CIs

	n	%
Deaf pupils with CIs (DW)	4	57.1
Deaf pupils with CIs (DWO)	3	42.9
Total	7	100.0

Age

There were different ages among the pupils within both groups, from the minimum age of six years to the maximum of 12. Tables 15 and 16 illustrate the number and age of participants.

Table 15: Deaf with CIs

Group	Age in year	N	%
Deaf pupils with CIs (DW)	10	2	50
	12	2	50
Total		4	100

Table 16: Deaf without CIs

Group	Age in year	N	%
Deaf pupils with CIs (DWO)	6	1	33.3
	10	2	66.7
Total		3	100

Academic Year

Pupils who were involved in the study were in Years 1, 3, 4 and 6 of primary school. Neither Year 2 nor Year 5 pupils were included in the study (Tables 17). This is because of a limited number of pupils in the pilot study and these were selected randomly.

Table 17: Academic year of pupils

	Participants			
Year	**DW**	**%**	**DWO**	**%**
1	0		1	(33.3)
2	0		0	
3	2	(50%)	0	
4	1	(25%)	2	(66.7%)
5	1	(25%)	0	
6	0		0	
Total	4	(100%)	3	(100%)

Father's Hearing Status

All fathers (n=7) of deaf pupils with/without CI have a normal hearing condition.

Mother's Hearing Status

All mothers (n=7) of pupils with CI have a normal hearing condition.

Number of Deaf Members of the Family

Regarding the existence of deaf family members, Table 18 shows that one participant from each group indicated that there was another deaf member in their family. One parent of a deaf pupil with a CI stated that there was another deaf person in his family. One parent of a deaf pupil without a CI has another deaf member in his family as well.

Table 18: Number of deaf members of the family

Participants (parents of deaf with/without)		**N**
PW	Yes	1
	No	3
	Total	4
PWO	Yes	1
	No	2
	Total	3

Early Intervention Programmes

Results for pupils with a CI show that 75% of them had an early intervention before starting school, whereas for the DWO group approximately 66% had been provided with such programmes (Table 19).

Table 19: Early intervention programmes status

Participants (deaf with/without)		**n**	**%**
DW	Yes	3	75.0
	No	1	25.0
	Total	4	100.0
DWO	Yes	2	66.7
	No	1	33.3
	Total	3	100.0

Communication Approaches

A communication approach means a strategy or a means used in school in order to deliver knowledge and skills to a deaf pupil. From Table 20 it can be seen that the DW group use a total communication approach for 50% (n=2) and with the rest of the pupils use an oral audio approach. The majority of the DWO group in this study used total communication, while 33% (n=1) used the oral audio way.

Table 20: Types of communication approaches used by deaf pupils

Participants (deaf with/without)		N	%
DW	Total communication	2	50.0
	Oral audio	2	50.0
	Total	4	100.0
DWO	Total communication	2	66.7
	Oral audio	1	33.3
	Total	3	100.0

Educational Settings

Regarding the types of educational settings of pupils who are involved in the pilot study, two pupils are in hearing impaired units attached within a mainstream school. Only one pupil with a CI studied in a mainstream classroom. Pupils without CI are divided into three types of educational setting: Deaf units attached within a mainstream school, Deaf units with part of the time in the school day in a mainstream classroom, and finally Hearing impaired units. Although the pupil who studies at a hearing impaired unit is totally deaf, he studies at a hearing impaired unit because he shows an ability in speech and language, as well as academic progress (see Table 21).

Table 21: Types of educational settings

Participants (deaf with/without)		n	%
DW	Hearing impaired units	2	50.0
	Hearing impaired units with part of day at main class	1	25.0
	Main classroom	1	25.0
	Total	4	100.0
DWO	Hearing impaired units	1	33.3
	Deaf unit	1	33.3
	Deaf units with part of day at main class	1	33.3
	Total	3	100.0

4.3.2 Differences between Deaf Pupils with/without CI in Terms of their Educational Progress

Research question will be addressed in this section is that are there differences between deaf pupils with/without CI in terms of their Educational Progress In this section, each subject's result will be presented for each group based on the academic reports and the Saudi evaluation system at primary school (details of this system were mentioned in Chapter Three). First, a general picture of both groups' results will be described, then an analysis of data in terms of pupils' variables and whether there is a relationship between them will be highlighted.

Mathematics

Half of Pupils with CIs, which represents two of them, have obtained all the mathematics required skills by while the rest of pupils got just the minimum required skills. This might indicate that there is a clear variation among pupils' educational progress, as no one received the middle score on the evaluation scale (when 66% of

the skills are gained). 33% of Pupils without CI obtained all the required skills in mathematics which is less than the percentage that is recorded by pupils with CI. Of the pupils without CI, 66% had acquired just the minimum required skills. It was noticed that neither group had recorded the lowest score when a pupil does not have the minimum required skills.

Table 22: Mathematics progress for groups

Participants (deaf with/without)		**n**	**%**
DW	Mastered all skills	2	50.0
	Mastered at least minimum required skills	2	50.0
	Total	4	100.0
DWO	Mastered all skills	1	33.3
	Mastered at least minimum required skills	2	66.7
	Total	3	100.0

Reading and Writing

From Table 23, it can be seen that of the pupils with CI, only one obtained the highest score on the evaluation scale, while the rest of the pupils are divided between mastering 66% of the skills and the minimum required skills. Of the pupils without CI, the table shows that no one obtained the highest score and also there was one pupil who received the lowest degree, which is considered as a fail, and he should repeat the same academic year.

Table 23: Reading and writing progress for groups

Participants (deaf with/without)		n	%
DW	Mastered all skills	1	25.0
	Mastered 66% including minimum skills required	1	25.0
	Mastered at least minimum skills required	2	50.0
	Total	4	100.0
DWO	Mastered 66% including minimum skills required	1	33.33
	Mastered at least minimum skills required	1	33.33
	Has not mastered all minimum skills required	1	33.33
	Total	3	100.0

Religious Studies Progress

Half of the pupils with CI acquired 66% of the skills in this subject, whereas most of the pupils without CI achieved the minimum required sills. It is important to point out that religious studies as well as reading skills require speech, listening ability and imagination in order to interrelate the meanings between the words heard and the concepts.

Table 24: Religious studies progress for groups

Participants (deaf with/without)		n	%
DW	Mastered all skills	1	25.0
	Mastered 66% including minimum required skills	2	50.0
	Mastered at least minimum required skills	1	25.0
	Total	4	100.0
DWO	Mastered 66% including minimum required skills	1	33.3
	Mastered at least minimum required skills	2	66.7
	Total	3	100.0

Science Progress

In science, all the pupils without CI had acquired the minimum required skills. The other group showed their ability to record all skills and 66% of the skills. However, there was one pupil with a CI who failed to obtain the minimum required skills. This might indicate that not only might a subject that relies on language ability be difficult for a deaf pupil, but also skills that depend on reasoning such as sciences.

Table 25: Science progress for groups

Participants (deaf with/without)		n	%
DW	Mastered all skills	1	25.0
	Mastered 66% including minimum required skills	2	50.0
	Has not mastered all the minimum required skills	1	25.0
	Total	4	100.0
DWO	Mastered at least minimum required skills	3	100.0

Social Science Progress

This subject shows that both groups obtained significantly poor results. Two of the pupils with CI were omitted from the results because they do not have this subject in their year. Other pupils within this group showed that poor results had been obtained, as no one achieved high scores and one of them was recorded as a fail. Most of the pupils without CI had failed to obtain at least the minimum required skills.

Table 26: Social science progress for groups

Participants (deaf with/without CI)		**n**	**%**
DW	Mastered at least minimum required skills	1	50.0
	Has not mastered all minimum required skills	1	50.0
	Total	2	100.0
DWO	Mastered at least minimum required skills	1	33.3
	Has not mastered all minimum required skills	2	66.7
	Total	3	100.0

Progress in Art

It is claimed that the subject of art is interesting for deaf pupils. Pupils with CI showed that 50% (n=2) had obtained all the skills in the subject, compared to 33% (n=1) of pupils without CI.

Table 27: Progress in art for groups

Participants (deaf with/without)		n	%
DW	Mastered all skills	2	50.0
	Mastered 66% including required skills	1	25.0
	Mastered at least minimum required skills	1	25.0
	Total	4	100.0
DWO	Mastered all skills	1	33.3
	Mastered 66% including required skills	2	66.7
	Total	3	100.0

Progress in PE

All the pupils with/without CI showed good results in PE. However, pupils with CI showed a good ability in this subject.

Table 28: Progress in PE for groups

Participants (deaf with/without)		n	%
DW	Mastered all skills	3	75.0
	Has not mastered all minimum required skills	1	25.0
	Total	4	100.0
DWO	Mastered all skills	1	33.3
	Mastered 66% including minimum required skills	2	66.7
	Total	3	100.0

Perspective of Parents and Teachers of Pupils with CI Towards Educational Progress

Of the parents of pupils with CI, 75% (n=3) admitted that their children had made good educational progress after the CI compared to their results before. In addition, 80% (n=8) of the teachers indicated that there were positive results shown by deaf pupils with CI. For instance, one teacher stated: "*Yes, the cochlear implant has played a role in the change and evolution of students in terms of the educational aspect*".

Both parents and teachers indicated that the progress involves positive results in school subjects and increasing vocabulary and language structures.

Importantly, 30% of the teachers claimed that CIs could have a positive impact regarding inclusive education. One teacher commented: "*There is no doubt that a cochlear implant has a substantial impact upon attainment and inclusive education*".

In contrast, 25% of the parents and 10% of the teachers responded negatively regarding the impact of CIs upon educational progress. Moreover, one teacher stated that the situation of pupils before surgery should be measured in terms of their educational progress. It was added that it "*may be difficult to determine such impact accurately because I did not measure the level of the student before the implants*".

Moreover, although the majority of participants indicated that there was a positive impact of CIs upon educational progress, they used the word "but" after their agreement about such an impact. This word refers to the requirements that could enhance the outcomes of CIs as claimed by parents and teachers. For instance, the time of implantation, the rehabilitation programme after the implant, and early intervention programmes are among these requirements. One teacher argued that

"*Vocabulary increases when a child has a cochlear implant, especially if it is done in the first two years*". Therefore, it seems that there are differences among pupils with CIs themselves. One teacher stated that it "*must be kept in mind that results vary between deaf children after surgery*".

This could explain the differences that were discussed earlier regarding the educational progress of pupils with CIs based on their academic report. Other factors were also mentioned, such as parents' awareness and training, qualified teachers and government support.

With respect to clinicians, it is crucial to point out that although perspectives regarding the impact of CIs upon educational progress had been given by the clinicians, their answers did not seem to be in depth and were incomplete. This may be due to that they are not specialists in the field of education. However, such participants gave a wide range of responses regarding the surgery itself and the impact upon hearing and speech development, as well as the factors affecting CIs.

4.3.3 Discussion of Findings – Pilot Study

Pupils with CIs

This analysis takes account of the time of implantation, bilateral implants, the number of deaf family members, early intervention, educational settings and communication approaches as independent variables, and examines pupils' educational progress in different subjects in order to identify whether there are differences among them according to these variables.

From the pupils' results, it can be seen that the time of implantation and early intervention variables seem as if they might have an impact upon the pupils' educational progress, whereas bilateral implants, the number of deaf family members and communication approaches might not have a clear influence upon the outcomes.

Chapman et al. (2011) claimed that preventing or reducing negative developmental consequences could be enhanced by the initiation of appropriate early intervention services before she/he becomes six months old. In addition, this intervention aims not just to help children acquire new skills and knowledge, but also to use and maintain these skills and knowledge (Dockrell & Messer, 1999).

The pupil with a CI who had not been provided with early intervention programmes and whose time of implantation was the highest age among the pupils with CI sample (at eight years old) showed a poor result in all subjects expect Art and PE. Therefore, awareness and consideration of those factors affected by profound deafness might be critical for diagnosis, prediction and treatment and for explaining why some children perform poorly with their CIs (Pisoni et al., 2008). Moreover, although this pupil has a CI in both ears and there is no other deaf member in his family, this has no influence upon his results.

The other three pupils with CIs in the same group who had an early intervention programme and had the CIs at five years old and earlier, showed good educational progress in all subjects. However, there are differences between them in reading and writing.

With respect to the educational setting, it is critical to point out that there was just one pupil who was involved with this pilot study and who studied in a mainstream classroom, whereas the rest of the pupils are at hearing impaired units attached

within a mainstream school. According to Wheeler et al. (2009, p:41), “Some studies have explored whether those children in oral educational settings do better than those in educational settings using signed communication (Connor et al., 2000; Geers et al., 2003; Tobey et al., 2004), with an interest in discovering whether some educational programmes are more effective in supporting children with implants than others”.

Therefore, due to this very limited number, the researcher believed that it might be difficult to decide at the pilot stage whether this might be an influence that could be shown by this variable.

Pupils with CIs vs Pupils without CIs

The descriptions of pupils with/without CIs mentioned earlier show that there are significant differences between their results in all subjects. The percentage of pupils with CIs who mastered all skills in all subjects are higher than the percentages for pupils without CIs.

Although the pupils with CIs are at a relatively average level in mathematics, reading and writing, their results are still higher than pupils without CIs.

It is worth pointing out that both groups show poor results in the social education subject. This might be because such a subject is about history and geography and needs a high ability in imagination and relies on a good memory, which is indicated by studies as one of the difficulties that deaf children might have. Thus, such a similarity between deaf children with/without CIs might lead to considering and investigating further whether CIs could enhance the memory of a deaf child.

4.4 Benefits of Cochlear Implants upon Inclusive Education for Deaf Pupils

Research question will be addressed in this section is that what the impact of CIs upon the inclusive education. The perceptions of the parents and teachers of DW regarding CIs as a tool in enhancing the inclusive education of deaf pupil will be presented in this section. The data about this question lead to findings regarding the impact of CIs upon deaf pupils in terms of potential inclusivity that could be enhanced by such intervention in mainstream schools and especially inclusion within mainstream classrooms.

It seems that there is a high level of parental agreement regarding a positive impact of CIs in enhancing inclusive education for deaf pupils with CIs. From Table 18 it can be seen that the mean of the response regarding the five aspects of inclusive education that are set in this study are more the 3.30 of 5. It can also be noticed that no strong disagreement was recorded through the parents' responses.

Table 29: Findings by PW regarding aspects could enhance inclusive education for deaf with CIs

	N	Minimum	Maximum	Mean
Relationships	4	3	5	4.00
Independence	4	3	4	3.50
Participation and Competition	4	2	4	3.33
Student's Voice	4	2	5	3.63
Academic Ability	4	3	5	4.58

The assertion to be explored is that if the five aspects of relationships, independence, participation and competition, student voice, and academic ability have been

enhanced by CIs, this might result in enhancing inclusive education for deaf pupils with CIs. However, these aspects are considered as ability dimensions, which pupils should have to be able to study in a mainstream classroom. There are certain characteristics of successful inclusive classrooms, such as administrators' support, special education support, effective teaching skills and an appropriate curriculum (Mastropieri & Scruggs, 2001). However, these characteristics have not been included here because these are related to different issues, such as government policies, rather than being related to CIs and the research focus on the impact of CIs on a deaf individual's ability that is claimed might result in her/him being able to be included in school.

From the parents' perspective, it could be argued that these five aspects have been influenced positively by CIs. For instance, regarding academic ability, 75% of the parents strongly agreed that with the help of cochlear implants, a deaf student could study in a mainstream classroom along with his/her hearing peers. In addition, 75% of the parents strongly agreed that with the help of cochlear implants, a deaf student could manage to develop his/her educational achievement effectively.

From such results, it might be claimed that CIs would help deaf children to be included within mainstream classrooms rather than special schools or segregated units attached to public schools. The concept of inclusion explicitly refers to the elimination of any type of discrimination or exclusion of any kind of need. The SEN Code of Practice (2001) also focuses on ensuring that children with special educational needs receive top priority and the opportunity for education without any kind of discrimination or segregation. It seems that the aspiration of inclusive education is to remove the social exclusion that is a result of attitudes to variety in race, social class, ethnicity, religion, gender and ability (Ainscow & Cesar, 2006).

This concept was expressed by the Salamanca World Conference on Special Needs Education (UNESCO, 1994).

The participation and practice that a pupil would be involved in might have a positive impact on his/her self-concept that is affected by deafness and by isolation that might have existed in the pupil's environment. Cambra (2002) argued that the formation of the self-concept could be affected by two main groups of factors. Firstly, explicit variables such as deafness itself and all the implications that might arise as a consequence, such as age and socialisation problems; secondly, implicit variables such as all the issues related to education settings, degree of disability, acceptance by parents, relatives, peers, teachers and the local community.

In addition, the parents showed their agreement with regard to the positive situation of deaf children with CIs regarding their child's independence at school. It seems that a CI reduces the deprivation of hearing and then supports a deaf child to communicate effectively with teachers and students.

Burkey (2006) claimed that a hearing impairment might reduce independence as a result of communication difficulty.

4.4.1 Teachers' Perceptions Regarding the Academic Ability of Deaf Children with CIs

The teachers' responses recorded a high mean (4.00) in relation to the academic ability that could be supported by CIs. All teachers (n=10) did not response negatively regarding the impact of CIs in enhancing the inclusive education. This might reflect their agreement towards the ability of deaf pupil who have CIs in studying within mainstream school and improve he/she academic achievement.

Table 30: Descriptive statistics to parents and teachers responses towards the academic ability

Participants (PW + T)	N	Minimum	Maximum	Mean
Parents of deaf with CI	4	3	5	4.58
Teachers	10	3	5	4.00

As mentioned in the methodology chapter, 11 items that represent the five basic elements were set in order to be used as indications of the impact of CIs upon inclusive education for deaf pupils. It is believed that these elements could enhance inclusion for children with SEN.

The general findings of the parents' responses about the inclusive education aspect will be presented and then the mean of the five aspects will be discussed. After that, the teachers' responses regarding academic ability and whether there are differences between their and the parents' responses will be examined. It is significant to point out that teachers have been involved in the academic ability aspect. However, the researcher will involve them in all aspects of the main study.

The findings of parents of deaf with CIs towards the impact of CIs upon the inclusive education

In this section the findings of parents of deaf with CIs towards the impact of CIs as a tool that could enhance different aspects of deaf child (educationally, sociologically and physically) so that he/she would have the ability to be included within mainstream school.

Relationships

Table 31: Can the student develop relationships with his peers naturally?

	n	%
Neutral	1	25.0
Agree	2	50.0
Strongly agree	1	25.0
Total	4	100.0

Independence

Table 32: Can the student manage all his needs in school without outside help?

	n	%
Neutral	1	25.0
Agree	2	50.0
Strongly agree	1	25.0
Total	4	100.0

Table 33: Can the student deal with any problem he faces inside school?

	n	%
Neutral	4	100.0

Participation and Competition

Table 34: Does the student exercise activities with his peers inside school?

	n	%
Neutral	1	25.0
Agree	2	50.0
Strongly agree	1	25.0
Total	4	100.0

Table 35: Does the student compete in practising his physical activities and different games in school?

	n	%
Strongly disagree	1	25.0
Neutral	1	25.0
Agree	1	25.0
Strongly agree	1	25.0
Total	4	100.0

Table 36: Does the student participate in educational and artistic programmes as extra-classroom activities that develop and activate his linguistic competence and hearing capacity?

	n	%
Strongly disagree	1	25.0
Disagree	1	25.0
Neutral	1	25.0
Strongly agree	1	25.0
Total	4	100.0

Student's Voice

Table 37: Can the student express his needs inside school to his teachers and peers?

	n	%
Disagree	2	50.0
Strongly agree	2	50.0
Total	4	100.0

Table 38: Can the student express his feelings inside school to his teachers and peers?

	n	%
Disagree	1	25.0
Neutral	1	25.0
Strongly agree	2	50.0
Total	4	100.0

Academic Ability

Table 39: With the help of a cochlear implant, could the deaf student manage to develop his educational achievement effectively?

	n	%
Agree	1	25.0
Strongly agree	3	75.0
Total	4	100.0

Table 40: With the help of a cochlear implant, could the deaf student study in a mainstream classroom along with his hearing peers?

	n	%
Neutral	1	25.0
Strongly agree	3	75.0
Total	4	100.0

Table 41: With the help of a cochlear implant and by placing the student in the first row of the classroom, could the student enhance his learning experience?

	n	%
Neutral	1	25.0
Strongly agree	3	75.0
Total	4	100.0

4.5 Perceptions and Experiences of Parents and Teachers of Profoundly Deaf Pupils with CIs

The data relating to the factors that affect the outcomes of CIs indicate that the factors of the age of implantation, early intervention and using hearing aids had the highest mean of all the participants' responses. It was claimed that early detection of hearing impairment and timely intervention are considered a critical treatment for children's cognitive, verbal, behavioural, and social development (Chapman et al., 2011). However, in some studies, age of implantation was not found to be related with particular academic skills, such as reading comprehension (Marschark et al., 2010). Moreover, Marschark et al. (2010) argued that such studies deal with children who have later onset hearing losses and later implantation, so better reading ability as a result of having greater language skills which enhanced their reading.

The factors of law and regulations, family awareness and the presence of another deaf member in the family have the lowest mean of all the participants' responses.

Table 42: Parents', teachers' and clinicians' responses regarding factors affecting CIs

Factors	N	Minimum	Maximum	Mean
Age of implantation	23	3	5	4.83
Early intervention	23	3	5	4.83
Rehabilitation programmes	23	3	5	3.67
Family awareness	23	2	5	3.30
Teamwork	23	1	5	4.48
Number of hearing-impaired in a family	23	1	5	3.35
Laws and regulations	23	1	5	2.61
Using a hearing aid	23	3	5	4.61
Approaches to dealing with students	23	3	5	3.70
Total	23			

All the responses of parents of deaf pupils with CIs showed strong agreement towards the impact of all factors except teamwork and law and regulations. It seems that the parents did not agree that these two factors were effectively provided in Saudi Arabia and it might be believed that the lack of these two factors could affect their children's outcomes.

Most of the teachers, however, indicated that the presence of another deaf family member did not have a significant impact upon educational progress. This factor had the lowest mean (1.80) of all the teachers' responses. There was also a similarity between the teachers and parents regarding the lack of effective law and regulations issued by the authorities that are concerned with rendering rehabilitation, education and teaching services to students with a cochlear implant. Thus, it is claimed that such regulations should be effective in that they render the required services adequately.

In contrast to the teachers, the clinicians' responses regarding the impact of another existing deaf member in the family suggested that 77% agreed that there was an impact of such a factor. This percentage of agreement is similar to the parents' agreement percentage regarding the same response. This might indicate that the clinicians and parents responded based on their experience, whereas the teachers seemed to suggest that there might be a lack of information that teachers could obtain about a pupil's life. This assumption was pointed out by one of the teachers as well.

By using the Pearson correlation sig. (2-tailed) correlation is significant at the 0.05 level between the factors of the age of implantation and an early intervention programme. A correlation between rehabilitation programmes at the level of 0.01 with family awareness was also found, while rehabilitation programmes are correlated with different factors at the level of 0.05 with teamwork, law and regulations, and communication approach. From these correlations, a similarity between such data and the perspectives of participants can be seen regarding the requirements of successful educational progress that were discussed earlier within this section. Moreover, family awareness is correlated with two factors, which are the presence of more than one deaf member in the family and law and regulations.

Factor 1: Age of implantation

Table 43: Age of implantation

Participants (PW + T + C)		Frequency	%
Parents	Strongly agree	4	100.0
Teachers	Neutral	1	10.0
	Agree	1	10.0
	Strongly agree	8	80.0
	Total	10	100.0
Clinicians	Agree	1	11.1
	Strongly agree	8	88.9
	Total	9	100.0

Factor 2: Early intervention

Table 44: Early interventions

Participants (PW + T + C)		Frequency	%
Parents	Strongly agree	4	100.0
Teachers	Agree	1	10.0
	Strongly agree	9	90.0
	Total	10	100.0
Clinicians	Neutral	1	11.1
	Agree	1	11.1
	Strongly agree	7	77.8
	Total	9	100.0

Factor 3: Rehabilitation programmes

Table 45: Rehabilitation programmes (A)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Neutral	1	25.0
	Strongly agree	3	75.0
	Total	4	100.0
Teachers	Agree	1	10.0
	Strongly agree	9	90.0
	Total	10	100.0
Clinicians	Agree	4	44.4
	Strongly agree	5	55.6
	Total	9	100.0

Table 46: Rehabilitation programmes (B)

Participants (PW + teachers + clinicians)		Frequency	%
Parents of deaf with CI	Strongly disagree	1	25.0
	Disagree	1	25.0
	Neutral	2	50.0
	Total	4	100.0
Teachers	Strongly disagree	3	30.0
	Disagree	5	50.0
	Neutral	1	10.0
	Agree	1	10.0
	Total	10	100.0
Clinicians	Disagree	2	22.2
	Neutral	3	33.3
	Agree	3	33.3
	Strongly agree	1	11.1
	Total	9	100.0

Table 47: Rehabilitation programmes (C)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Strongly agree	4	100.0
Teachers	Agree	2	20.0
	Strongly agree	8	80.0
	Total	10	100.0
Clinicians	Agree	2	22.2
	Strongly agree	7	77.8
	Total	9	100.0

Factor 4: Family awareness

Table 48: Family awareness (A)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Strongly disagree	1	25.0
	Disagree	2	50.0
	Agree	1	25.0
	Total	4	100.0
Teachers	Strongly disagree	3	30.0
	Disagree	4	40.0
	Neutral	3	30.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Neutral	5	55.6
	Agree	2	22.2
	Strongly agree	1	11.1
	Total	9	100.0

Table 49: Family awareness (B)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Disagree	2	50.0
	Neutral	1	25.0
	Strongly agree	1	25.0
	Total	4	100.0
Teachers	Strongly disagree	3	30.0
	Disagree	5	50.0
	Neutral	2	20.0
	Total	10	100.0
Clinicians	Disagree	4	44.4
	Neutral	3	33.3
	Agree	2	22.2
	Total	9	100.0

Table 50: Family awareness (C)

Participants (PW + teachers + clinicians)			Frequency	Percent
Parents of deaf with CI		Strongly agree	4	100.0
Teachers		Strongly agree	9	90.0
	Missing	System	1	10.0
	Total		10	100.0
Clinicians		Strongly agree	9	100.0

Factor 5: Teamwork

Table 51: Teamwork (A)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Strongly disagree	2	50.0
	Agree	1	25.0
	Strongly agree	1	25.0
	Total	4	100.0
Teachers	Strongly agree	9	90.0
	Missing System	1	10.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Agree	3	33.3
	Strongly agree	5	55.6
	Total	9	100.0

Table 52: Teamwork (B)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Strongly disagree	1	25.0
	Strongly agree	3	75.0
	Total	4	100.0
Teachers	Agree	1	10.0
	Strongly agree	9	90.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Agree	1	11.1
	Strongly agree	7	77.8
	Total	9	100.0

Factor 6: The presence of more than one hearing-impaired individual in a family

Table 53: Participants' agreements regarding the effect of number of hearing-impaired in a family

Participants (PW + teachers + clinicians)		Frequency	Percent
Parents	Neutral	1	25.0
	Agree	2	50.0
	Strongly agree	1	25.0
	Total	4	100.0
Teachers	Strongly disagree	1	10.0
	Disagree	4	40.0
	Neutral	4	40.0
	Agree	1	10.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Neutral	1	11.1
	Agree	4	44.4
	Strongly agree	3	33.3
	Total	9	100.0

Factor 7: Laws and regulations

Table 54: Laws and regulations

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Strongly disagree	1	25.0
	Neutral	2	50.0
	Strongly agree	1	25.0
	Total	4	100.0
Teachers	Strongly disagree	5	50.0
	Disagree	3	30.0
	Neutral	1	10.0
	Agree	1	10.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Neutral	5	55.6
	Agree	2	22.2
	Strongly agree	1	11.1
	Total	9	100.0

Factor 8: Using a hearing aid

Table 55: Using a hearing aid (A)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Agree	1	25.0
	Strongly agree	3	75.0
	Total	4	100.0
Teachers	Agree	3	30.0
	Strongly agree	7	70.0
	Total	10	100.0
Clinicians	Neutral	1	11.1
	Agree	3	33.3
	Strongly agree	5	55.6
	Total	9	100.0

Factor 9: Approaches to dealing with students

Table 56: Using a hearing aid (B)

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Disagree	1	25.0
	Neutral	1	25.0
	Agree	1	25.0
	Strongly agree	1	25.0
	Total	4	100.0
Teachers	Disagree	1	10.0
	Neutral	1	10.0
	Agree	6	60.0
	Strongly agree	2	20.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Neutral	1	11.1
	Agree	3	33.3
	Strongly agree	4	44.4
	Total	9	100.0

Table 57: Approaches to dealing with students

Participants (PW + teachers + clinicians)		Frequency	%
Parents	Disagree	1	25.0
	Strongly agree	3	75.0
	Total	4	100.0
Teachers	Disagree	3	30.0
	Neutral	3	30.0
	Agree	4	40.0
	Total	10	100.0
Clinicians	Disagree	1	11.1
	Neutral	3	33.3
	Agree	4	44.4
	Strongly agree	1	11.1
	Total	9	100.0

Chapter 5: Results

5.1 Overview of Data

As mentioned earlier, the aim of this research is to explore the benefit of cochlear implants upon the educational progress and educational placements of deaf pupils at primary school in Saudi Arabia. Also, it aims to identify factors that affect the benefits of CI from the perspective of parents, teachers and clinicians. This chapter examines findings of the data that were collected in the study. Key responses from the questionnaires, both quantitative and qualitative, and from interviews will be presented, in order to address the research questions which underpin this study. The reader is reminded of these research questions:

Research Question 1:

What is the parental decision-making process regarding whether to have a CI for their deaf child?

1a. what are the perceptions and expectations of parents prior to deciding to have/not to have CI surgery for their child?

Research Questions 2:

What are the benefits of CIs for the educational progress of deaf pupils in primary school in SA?

2a. what are the post-CI surgery experiences of parents, teachers and clinicians regarding the benefit of CIs for the educational progress of deaf pupils with CIs?

2b. what are the differences between deaf pupils with/without cochlear implants in their educational progress based on school academic results?

2c. what are the participants' perceptions of experiences towards factors affecting the educational progress of deaf pupils with CIs?

Research Question 3:

To what extent does CI surgery affect educational placement of deaf pupils at primary schools in SA?

3a. what are the current types of educational setting for pupils who have CIs in primary school in Riyadh?

3b. what are participants' experiences towards the impact of CIs on enhancing inclusive education for deaf pupils with CIs?

3c. what are the perceptions and experiences regarding the role of the educational environment upon inclusive education for deaf pupils with CIs?

This chapter will attempt to address these questions and any associated topics, through the presentation of data collected from the participants. Firstly, the pre-perceptions and expectations of parents who decided to/not to have a CI and the decision-making process will be examined. Attention will also be given to issues which might affect such expectations. Secondly, the benefit of cochlear implants upon the educational progress of deaf pupils will be investigated as follows: by exploring post experiences of the benefits of CI for the educational progress of pupils with this treatment and the advantages and disadvantages of CI from the experiences of parents, teachers and clinicians. The academic performance of pupils with CI will also be presented by both parents' and teachers' experiences. Moreover, the differences between these pupils' attainments and deaf students without CI will be identified. Factors that might affect the outcomes of CI will be investigated.

Finally, the benefit of CI upon the educational placement of pupils with CI will be explored, based on the current situation of these students' educational settings. This leads to explore the impact of CI in enhancing inclusive education for those pupils from the perceptions and experiences of parents and teachers. The role of

environment that could affect the educational placement for these students will also be presented.

5.2 Profile of Participants

5.2.1 Participants in Main Study

Table 58: The categories, number and gender of participants involved in the study

Participants	Participants in Questionnaires		Total	Participants in Interviews		Total
	Male	Female		Male	Female	
Parents of pupils with cochlear implants	38 (86.4%)	6 (13.6%)	44 (25%)	10	0	10 (50%)
Parents of pupils without cochlear implants	50 (88%)	7 (12%)	57 (32.3%)	---	---	----------
Teachers	65 (100%)	0	65 (36.9%)	10	0	10 (50%)
Clinicians	8 (80%)	2	10 (5.6%)			----------
Total	**161(91.4%)**	**15(8.6%)**	176 (100%)	**20**	**0**	20 (100%)

Table (58) shows the categories and number of participants involved in the study for both questionnaires and interviews. The total number of questionnaire respondents is 176, including parents of deaf pupils with/without CIs (total101, 57.3%) teachers of pupils with CIs in primary schools(total 65,36.9%), and clinicians (speech therapists and audiologists) in the cochlear implant centre in Riyadh, Saudi Arabia (total 10, 5.6%). The interviewees comprise twenty participants among parents and teachers of deaf pupils with CIs.

5.2.2 Characteristics of Participants

5.2.2.1 Parents of Deaf Pupils with/without CIs

Table 59: Hearing level of fathers and mothers of deaf pupils with/without CIs

Participants	Hearing level	Parents of deaf with CI		Parents of deaf without CI	
		n	%	n	%
Fathers	Normal	40	90.9	50	87.7
	Profound	4	9.1	7	12.3
	Total	44	100.0	57	100.0
Mothers	Normal	43	97.7	52	91.2
	Profound	1	2.3	5	8.8
	Total	44	100.0	57	100.0

Table 59 above shows the hearing levels of the parents of deaf pupils with/without CIs. From the table it can be seen that for both groups of pupils the majority of parents have normal hearing (fathers 90.9% and 87.7% for deaf with/without CI respectively). However, the percentage of profound hearing loss is higher for parents of deaf pupils without CI compared to parents in the other group (fathers:12% compared to 9%, mothers:8.8% and 2.3%).

Table 60: Deaf member in family of deaf pupil with/without CI

Participants	Parents of deaf with CI		Parents of deaf without CI	
Deaf member in family	**N**	**%**	**n**	**%**
Yes, they have more than one	22	50	29	50.9
No, they have not	22	50	28	49.1
Total	44	100	57	100

From Table 60 it can be shown that there is a similar percentage of more than one deaf member in the family of a deaf pupil with and without CI (50.9%and 49.1% respectively). However, this percentage, which represents half of participants in both

groups, might be considered as a substantial percentage of families which have many deaf children.

Table 61: Parents of deaf pupils with/without CI qualifications

Participants	**Parents of deaf with CI**		**Parents of deaf without CI**	
Qualifications	**N**	**%**	**n**	**%**
High school	24	54.5	38	66.7
Bachelor degree	16	36.4	6	10.5
Masters degree	1	2.3	3	5.3
Other	3	6.8	10	17.5
Total	44	100	57	100

Types of qualifications of both parents of deaf pupils with/without CIs are presented in the above table. It can be seen that there is a high percentage of participants who only have a high school degree and have not carried on their education. Also, the percentage of parents of deaf pupils with CIs who have a Bachelor degree is significantly higher (n= 44, 36.4%) than parents of deaf pupils without CIs (total 57, 10.5%). Nevertheless, the latter group has a higher percentage of parents who have a Masters degree although it is low percentages compared to other qualifications.

5.2.2.2 Deaf Pupils with/without CI at Primary School

Table 62: Age for deaf pupils with/without CI

Participants	**Deaf with CI**				**Deaf without CI**			
Age (in years)	Mean	Mode	Min.	Max.	Mean	Mode	Min.	Max.
	9.5	10.5	6	16	11.5	12.6	6	16.5
Total	44 deaf pupils with CI				57 deaf pupils without CI			

It is crucial to point out that the age range of students without CIs is very high compared to the average age of students at the primary school. This might suggest

that attention should be given to such difference to try to find out whether or not there is an impact of not having CIs upon the high level of age for pupils who study at primary school (more details will be given in this chapter). Based on The Ministry of Education regulations, the age range for primary school pupils is between six years, which is the legal age of starting school, and twelve years, which is the end of this stage. However, the number of pupils without CIs who exceeded this age range and who are still studying at primary school, is twenty-four pupil (n=24,42%) whereas the number of pupils with CIs is four (n=4, 9%) pupils. Therefore, this situation might highlight the potential impact of CIs in helping deaf students to be both enrolled and finish the primary stage within the appropriate age rage. Also, it might be a concern as teenagers are studying along with younger children at the same school. (The wider implications of this finding will be discussed in the following chapter, Discussion).

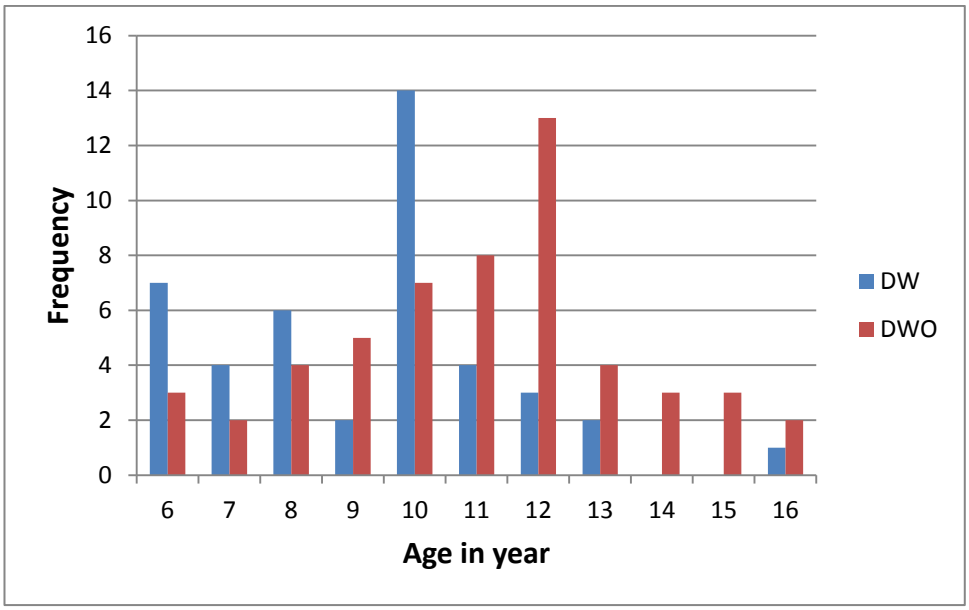

Figure 4: Age distribution of deaf pupils with/without CI at primary school

The figure above shows the age range of the students involved in the study. This range is between six years and sixteen years. Also, a comparison of the number of

students at every age in both groups can be seen. It is also apparent that the number of deaf pupils without CI (DWO) between the age of thirteen and sixteen is significantly higher than the number of deaf students with CIs (DW).

Table 63 shows that the mean age of implantation is 4.6 years, with the minimum age being one year old and the maximum fourteen years old, which is considered a late for having such treatment. However, there is just one pupil who had CI at the age of fourteen whereas the majority are at five year old.

Table 63: Age implantation in years for deaf pupils with CI

Participants	**Deaf pupils with CI**			
Age implantation in years	Mean	Mode	Min.	Max.
	4.6	5	1	14
Total	44 deaf pupils with CI			

Table 64: Educational settings of pupils with/without CI

Education settings type	**Deaf pupils with CI**		**Deaf pupils without CI**	
	n	**%**	**n**	**%**
Hearing impaired units at mainstream school	28	63.6%	0	0.0%
Hearing impaired units with part day at mainstream classroom	4	9.10%	0	0.0%
Mainstream classroom	0	4.6%	0	0.0%
Deaf unit with part day in mainstream classroom	1	2.2%	0	0.0%
Deaf unit at mainstream school	2	2.6	44	77.2%
Deaf school	9	2.5	13	22.8%
Total	44	100%	57	100%

Table 64 shows the types of educational settings of pupils with/without CI. It can be seen that the majority of deaf pupils who have CIs are educated at hearing-impaired classes at mainstream school (n=28, 63.6%). Also, around 25% (n=11) study at either

deaf classes at mainstream school or at special schools for deaf children, which can be considered exclusive education. Whereas, deaf pupils without CIs are only educated at either deaf units attached within mainstream schools (77.2%) or deaf schools (22.8%).

Table 65: Communication approach used at school for pupils with/without CIs

Communication approach	Pupils with CIs		Pupils without CIs	
	n	%	n	%
sign language	7	15.9	45	78.9
Total commination	22	50.0	7	12.3
Oral audio	15	34.1	5	8.8
Total	44	100	57	100

Table 66: Unilateral and bilateral pupils with CI

	n	%
Unilateral implant (In one ear)	36	81.8
Bilateral implants (In both ear)	8	18.1
Total	44	100

From table (66) it can be seen that 81.8% of deaf pupils with CIs in the study have CI in one ear whereas just 18.1% have bilateral implants involving both ears.

5.2.2.3 Teachers of Deaf Pupils with CI

Table 67: Length of teaching experience

Experiences	N	%
5 years or less	4	6.2
6 to 10 years	13	20.0
11 to 15 years	19	29.2
16 to 20 years	14	21.5
More than 20 years	15	23.1
Total	65	100.0

Table 67 shows experiences the range of teaching experience (in years) of teachers of deaf pupils with CIs. The highest percentage is for teachers who have between eleven and fifteen years of experience (n=19, 29.25) while the lowest percentage is five years or less of experience teaching (n=4, 6.2%).

Table 68: Teachers' qualifications

Qualifications	n	%
Bachelor in special education	48	73.9
Bachelor in education	11	16.9
Masters degree	6	9.2
Total	65	100.0

From table 68 it can be seen that the teachers involved in this study show some variations in their qualifications. The majority of teachers (73.9%) have a Bachelor degree in Special Education while the rest are divided between Bachelor in Education (16.9%) and Masters degree (9.2%).

Table 69: Teachers' training in special education programmes

Training received	n	%
Yes	45	69.3
No	20	30.7
Total	65	100

Table 69 shows whether teachers of deaf pupils with CIs have completed training courses in special education programmes; 69.3% (n=45) of the teachers have undergone such training while 30.7% (n=20) have not taken any kind of special education programme training.

5.2.2.4 Clinicians

Table 70: Clinicians' experience

Clinicians' experience	n	%
5 years or less	4	40.0
6 to 10 years	2	20.0
16 to 20 years	2	20.0
More than 20 years	2	20.0
Total	10	100

Table 70 shows experience in number of years of the clinicians. The highest percentage is for clinicians who have between five or fewer years of clinical experience, while the rest of the percentages are divided equally between other experience categories as shown in the table.

Table 71: Clinicians' classification

Clinicians' classification	n
Surgeon	1
Speech therapist	6
Audiologists	3
Total	10

From table 71 it can be seen that the clinicians involved in this study comprise various professional groups: Surgeon, Speech therapist and Audiologists.

5.3 Findings in Relation to Research Questions

5.3.1 First Research Question: What is the Parental Decision-making Process regarding whether to have a CI for their Deaf Child?

This question attempts to explore the perceptions and expectations of parents in prior deciding to have/not CI surgery for their child. Parents' expectations are considered as a factor that might affect the parental decision to have CI surgery for their child.

Both parents of deaf pupils with/without CI expectations will be examined in order to extract to what extent the parental expectation of CI outcomes might affect parental decision and specify factors that might affect these expectations.

Parents' of deaf pupils with CI expectations of CI outcomes and making decision

Table 72: Parents' expectations in prior deciding to have CI surgery for their child regarding the benefit of CI treatment on their child's educational performance

Levels of expectations	**n**	**%**
High level (Expect substantial improvement)	21	47.7
Medium level (Expect moderate improvement)	18	40.9
Low level (Expect some improvement)	5	11.4
Total	44	100.0

From table (72), it can be seen that majority of parents (47.7%) held high level expectation towards the impact of CI treatment on their child's educational performance. Also, just 11.4% of parents indicate that their expectation was within low level.

Table 73: Sources of information used for making decision

Source of information for decision	**n**	**%**
Hospital	36	81.8
Hospital and internet	5	11.3
Relatives who have experience	2	4.7
Media	1	2.2
Total	44	100.0

From the above table, it can be seen that the majority of parents (81.8%) obtained information used for making decision from hospital. Whereas, media as source of information that can be used for making such decision has 11.65%.

Factors might affect the parental expectations

Two factors were examined whether they might affect the parental expectations. These factors are awareness of potential benefits and awareness of possible negatives outcomes.

Table 74: Parents' agreement towards being made aware of possible negative and potential beneficial outcomes

Agreement	Aware of potential benefits	Aware of possible negatives outcomes
	Frequency	Frequency
Yes	25 (56.8%)	17 (38.6%)
No	19 (43.2%)	27 (61.4%)
Total	44 (100%)	44 (100%)

Table 74 shows parents' agreement towards being made aware of possible negative and potential beneficial outcomes that might occur with having cochlear implants in terms of educational and language outcomes. Respect to awareness of potential benefits of CI, higher percentage is for parents who agreed that they being made aware of such benefit. While in terms of awareness of possible negatives outcomes of CI, higher percentage is for parents who indicate that they were not made aware of this negativity.

Chi-Square analysis was undertaken to examine whether there is an association between awareness of possible negative and potential beneficial outcomes and level of the parental expectations towards CI outcomes. For instance, if parents were made aware of potential benefits would they raise their expectations of CI outcomes. Also, would the opposite position be applied if these parents were made aware of potential negative outcomes of CI. The following tables 75 and 76 will show first a statistic test regarding the parental awareness of potential benefits and level of CI

expectations and second the test respect to awareness of possible negatives outcomes versus the expectations will be presented.

Table 75: Awareness of potential benefits vs CI expectations

Aware of potential benefits	Parental expectations		Total
	High level	Moderate + Low	
Yes	12	13	25 (57%)
No	9	10	19 (43%)
Total	21	23	44 (100%)

Chi-Square Test

	Value	df	Sig. (2-sided)
Pearson Chi-Square	.002	1	.967
N of Valid Cases	44		

Table 76: Awareness of negatives outcomes vs CI expectations

Aware of possible negatives outcomes	Parental expectations		Total
	High level	Moderate + Low	
Yes	10	7	17
No	11	16	27
Total	21	23	44

Chi-Square Test

	Value	df	Sig. (2-sided)
Pearson Chi-Square	1.367	1	.242
N of Valid Cases	44		

All findings were statistically non-significant.

Parents of deaf pupils without CI expectations of CI outcomes and making decision

Parents of deaf pupils without CI have been involved in presenting their experiences and perception regarding CI treatment. Such involvement was conducted in order to discover the perceptions behind those parents of deaf pupils who decide against having this intervention, whether this decision was based on evidence or information against CI or because of lack of awareness and ability. This might help not just to

draw a picture regarding the extent of CI outcomes but also to raise awareness so that deaf children would not lose an opportunity to be educated, live and work as normally as their hearing peers.

The percentage of parents of deaf pupils without CIs who have a positive expectations of CI outcomes are 40% (n=23/57). Table (77) shows their perspectives on which aspects of CI can help deaf students. Also, there are a number of parents of deaf pupils without CI who stated either *'I do not know about CI'* (n=29/57, 50%) or *'CI does not help deaf pupils'* (n=3/57, 5.2%) and why (table,78).

Table 77: Parents of deaf without CI perspectives on which aspects of CI can help deaf students

Parents' responses 40% (n=23/57)	
Theme - Outcomes	Sub theme
Improving hearing	• Audibility
Improving speech	• Communication • Boosting language
Improving education	• Understanding subjects materials (input) • Perception, Comprehension • Learning ability
Sociable	• Creates better life • Confidence • Human being service • Help in work field
Inclusion	• Gives deaf pupils the power to be involved and included within the community

Parents of deaf pupils without CI who have a positive perception (n=23, 40%), state that such intervention needs an additional necessary requirement such as rehabilitation. One father says *'it is perfect in early age but what is more important than this is rehabilitation, commitment and spreading awareness of the child's benefit'*. One parent argues for *'Creating rehabilitation and CI surgery centres in all different regions in Saudi to prevent parents suffering. Also, this should not be just a*

commercial service but also a medical, therapeutic and educational provision'. Moreover, it is claimed that *'there is a lack of Saudi specialists in rehabilitation and education of pupils with CI'.*

Also, parents ask authorities and charity associations to take their responsibility in helping families with deaf children. It is argued that *'It is considered as a humanitarian service as it helps deaf children to be educated, live and work as normally as their hearing peers. I wish that such intervention was more common and governments and charity associations would adopt special needs'.* From parents' responses it can be seen that it seems that there is a kind of awareness regarding CI showed by parents of deaf pupils without CI as advantages are presented by this percentage of parents. Also, they are seeking rehabilitation and information about such treatment. However, there is uncertainty about the outcome of CIs and there is a demand for more guidelines or instructions that could help parents in this issue. One father says *'I think that CI is good for restoring hearing for the deaf. But I do not know to what extent CI surgery is successful. However I wish to have this surgery for my son in order for him to hear'.* Another parent points out that *'if it is clear that CI helps deaf pupils academically, there is no reason to reject it or not have it. However, there is no support and guidelines or instructions on this issue which is significantly important for deaf children'.* In contrast, one father believes in the positive impact of CIs upon education for deaf children and claims that '*it has a positive impact upon child education and we support it'.*

Nevertheless, there are parents of deaf children without CIs who have a negative perception of CI and refuse to allow their child to have such surgery because CI does not have any benefit. Also, other parents cannot build up any perception because of

lack of available information that can be provided by different associations such as the government, hospitals and schools.

Table 78: Number of parents of deaf pupils without CI who say I do not know or CI does not help deaf pupils, and why

I do not know	CI does not help deaf pupils
(n=29, 50%)	(n=3, 5.2%)
'We have no idea about others' experiences and we cannot know its impact upon educational outcomes'.	*'I do not see that it makes any difference in improving learning'*
'I do not have any background on this'	*'It causes headaches and it might be one reason for a negative impact on pupil's psychology'*
'As my child has not used it I cannot form an opinion'	
'No idea, fear and risk of result prevent us'.	

Table (78) shows a number of parents of deaf pupils without CI who say 'I do not know about CI' which is 50% (n=29) whereas parents who state that CI does not help deaf pupils are 5.2% (n=3). Also, from the table above it can be seen that different perceptions result in these conclusions which are taken by parents.

Moreover, parents of deaf pupils without CIs have also been involved in exploring the reasons behind not having this intervention. This might provide an explanation as to whether these parents abandon CIs because of its inefficiency, from their perspective, or for other reasons. This could lead to an initial assumption with respect to the benefit of CIs. For instance, exploring the reasons behind not having CI might be crucial in order to understand whether parents made this diction because of underestimating this intervention which might lead to re-evaluation of the impact of

CI; or this decision was made for other reasons which might indicate that the gap is not related with CI itself.

The following table (79) shows how many times the reason for not having cochlear implants was selected and the percentage of parents who did this selection. Because the reasons given are based on answering the question by circling/ ticking as many reasons as is applicable, a father might select more than one option (reason).

Table 79: Reasons given by parents of deaf pupils for not having cochlear implants

Reasons	**N (max .57 times)**	**%**
Lack of information and awareness	33	57.9%
Risks to health (implications)	29	50.9%
Low expectation of outcomes	28	49.1%
Medical reason	8	14.0%
High cost	7	12.3%

From table (79) it can be seen that the reason of lack of information and awareness takes the highest number of selected times and percentage of parent participants. One father claims that *'this treatment was not available to our knowledge at the birth of our child and then when he was seven years old we applied to have the surgery but were told by the hospital it is not suitable for his age'*. Also, other fathers say *'our child does not have CI because of he is too old'* and *'Because he has passed the right age to have CI'*. Moreover, it is claimed that *'lack of information and education of the cochlear implant and different performance of doctors made us retreat from doing surgery'*. Also, it is argued that *'the family did not find enough response from the hospital regarding whether or not we can do the surgery for our child'*. One father claims *'there is no concern paid by the Ministry of Health and Education for CI rehabilitation and education after surgery'.*

High cost as a reason does have the lowest percentage; although the cost of such surgery is significantly high (200,000 Real, 35,000 Pounds), most CI surgery in Saudi is funded by the government. However, the cost covers just the surgery rather than all the post implantation expenses for rehabilitation and maintenance of the device which, according to parents, are expensive and sometimes unaffordable. One parent argues, *'I cannot afford it but if my child is provided CI free we would not mind having it'.*

Risks to health and implications that might be a result of the surgery was also an obvious reason preventing parents from taking such a critical decision. One father says *'because of the pain and the child being deprived of the fun of childhood such as swimming and playing with kids'*; anther claims *'we have not made this decision due to our fear regarding medical risk as we heard that it might cause paralysis'.*

With respect to not having CI surgery for deaf children for medical reasons, one parent commented that *'there are no auditory nerves connected between the inner ear and the brain thus he cannot have a Cochlear Implant'*. Also, a father states that *'it has not been approved by doctors'*.

5.3.2 Second question: What are the Benefits of CI upon the Educational Progress of Deaf Pupils at Primary School in SA?

This question will be answered by parents', teachers' and clinicians' experiences and perceptions that were presented by open questions and interviews with respect to the educational performance and advantages/disadvantages of CI; and by exploring the level of educational progress of deaf pupils with CI based on school academic reports and also, by presenting the differences in school results between deaf pupils with/without cochlear implants using SPSS. Moreover, factors that could either

reduce or promote the benefits of cochlear implants will be highlighted with respect to the perspectives of parents, teachers and clinicians.

5.3.2.1 The Experiences of Parents, Teachers and Clinicians Regarding the Benefits of CI upon Educational Progress of Deaf Pupils with CI

Participants' responses, regarding pupils' educational progress, which are collected by open questions via questionnaires and interviewing ten selected parents and ten teachers, will be reported.

Open question (questionnaires):

In order to reach all participants and collect a wide range of experiences and perceptions, within the questionnaire, participants have been asked to answer and give explanations about whether cochlear implant has made any positive difference to your child/pupil/patient's educational progress at school. Thematic analysis in examining open questions on questionnaires is used. Statistics were extracted from data and then emerging themes were discussed.

Table (80) shows the number of participants' agreement regarding whether CI have an impact upon pupils' educational progress.

Table 80: Participants' agreement towards the impact of CI upon educational progress

Participants	Strongly agree	Agree	To some extent	Disagree	No answer
Parents of deaf pupil with CI (n=44)	----------	41	----------	3	----------
Teachers of deaf pupil with CI (n=65)	10	34	9	12	----------
Clinicians (n=10)	----------	9	----------	----------	1
Total (n=119)	10 (8.4%)	84 (70.5%)	9 (7.5%)	15 (12.6)	1 (0.84)

From the table above, it can be seen that high percentage of participants (parents, teachers, clinicians) agreed that CI has an impact upon deaf pupil educational progress (n=84/119, 70.5%). It worth to point out that there is clear majority of both parents (n=41/44) and clinicians (n=9/10) who agreed on this matter, whereas it was a variation in teachers responses.

The findings related to the advantages and disadvantages of cochlear implants from perceptions and experiences of participants will be presented next. Themes emerging in data mentioned and claimed by parents, teachers and clinicians will be highlighted in terms of themes' implications (advantages and disadvantages) upon educational progress.

The advantages of cochlear implant upon the deaf pupil:

It is worth pointing out that although participants were asked through open questions rather than specific areas of these questions, common answers have been found throughout the responses. All themes listed in the following table (81) are found by 50% or more of the respondents. For example, improving hearing which has between

79% and 90% of responses as well as educational improvement has 65% and inclusive education 50%. Thus, any theme that has 50% or more involves an advantage. These themes are improving hearing, educational improvement, improving language and speech, psychological and social, inclusive education and independency.

Table 81: Advantages of CIs shown by parents of deaf pupils with CIs, teachers and clinicians

	Participants		
	Parents of deaf with CIs	**Teachers**	**Clinicians**
Advantages	• Improving hearing: • Hearing voices and identifying them. • It does not cause any inconvenience for the child or headache like normal hearing aids.	• Audibility. • Sound recognition. • Benefiting from residual hearing. • Improving hearing realisation. • Increasing perception.	• Improving hearing: • Making learning hearing skills process easier. • Creating a significant auditability for profoundly deaf children.
	• Inclusion: • Enhancing inclusion within the surrounding environment.	• Inclusive education. • Inclusion within community.	• Inclusion within community and school.
	• Student voice: • Expressing himself and Understanding his needs.	• Student voice	----------
	• Abandoning sign language.	• Abandoning sign language.	• Enhancing verbal communication rather than sign language.
	• Language improvement: • Having conversations. • Speech improvement.	• Acquisition of language and speech: • Enriching vocabulary. • Speech intelligibility. • Enhancing verbal language.	• Language acquisition: • Speech acquisition. • Language is improving in high percentage.
	• Independency.	• Confidence.	• Very good for children who do not get benefit from hearing aid.
	• Educational improving: • Improvement in learning skills.	• Enhance desire of learning. • Educational level. • Helping for more consternation and attention.	• Impact upon education • Living would be enhanced in terms of their education and relationships.
	• Improving social skills.	• Sociability. • Positive attitudes.	----------

From table (81) it can be seen that parents of deaf pupils with CIs, teachers and clinicians state similar themes regarding the advantages of CI: Improving hearing, Inclusion, Abandoning sign language, Language and speech improvement, Improving social skills, Easy communication and Educational improvement. However, there are different themes such as Independency which is mentioned by parents whereas Confidence is stated by teachers. Also, clinicians claim that CI is helpful substitute for children who do not get any benefit from hearing aids. Parents on the other hand argue that there are no side effects upon the child.

i) Improving hearing

With respect to improving hearing advantage, one father said, *'my child can hear voices and recognise them, he has a good hearing now!'* One teacher mentions that *'CI make deaf pupils as average as their peers'*. Another teacher argues that *'increasing of perception is clearly noticed by teachers'.* Also, clinicians claim a substantial response regarding the impact upon hearing. One clinician states that *'CIs is creating a significant auditability for profoundly deaf children so their language is improved by a high percentage'*. Furthermore, a father claims that hearing which is improved by CIs helps the child to understand instructions whether in the classroom or at home. He said that it is *'easy to teach and deliver him the idea of a lesson'*. One parent argues that realising and identifying academic activities is one of the results that are gained by improving hearing. However, another parent claims that *'Yes, the improved hearing gained by CIs could help in improving educational progress, but not substantially, I expect that the reason is a lack of suitable curriculum for the hearing impaired, where it is difficult to deliver suitable material to them'.* Further data on the curriculums aspect will be within the Factors section.

Moreover, it is claimed by one father that the child would be able to participate in classroom work and identify sounds surrounding him. Teachers, also, point out that pupils who have CIs are delivering a better performance. One teacher states *'pupils interact in doing tasks effectively through hearing their peers in the classroom'.*

ii) Educational improvement

With respect to the educational improvement which is one of the significant advantages that are pointed out by participants, a teacher claims that *'enhancing the desire for learning and educational level could be gained by deaf pupils who have CI'*. Helping for more consternation and attention was mentioned within teachers' responses. Parents support this claim by stating that *'CIs can improve learning skills'*. Thus, improved performance level is claimed by parents of deaf pupils as a result of having CIs. Also, it is argued that *'it is easier for us as parents to teach our child who has CIs rather than using sign language!'* Teachers claim that the educational and cognitive level is being improved.

Also, it is argued that educational process could be enhanced by such treatment. However, one teacher says *'in my experience, I taught a pupil who has CI and I would say that it was not successful in terms of his educational performance'.* Other teachers support this claim and state *'there was little percentage of benefit because of lack of effective hearing rehabilitation and maybe because of the late age of implantation'*. Also, one teacher of deaf pupils emphasises these last factors and says that *'yes there is an improvement in educational progress but mainly with cases that acquired an effective training and rehabilitation from parents and special centres'*. Another teacher claims *'some pupils go from surgery room to classroom straightaway! Where is the reliable rehabilitation? Nothing!'*

Clinicians indicate that the impact upon academic attainment and inclusive education could be evaluated as an effective and significant outcome. Clinicians point out that *'academic attainment of pupils with CIs can be significantly improved especially if it is done before the age of 5 years so they can also be included within mainstream schools'.*

iii) Improving language and speech

Better communication is claimed by one father who says *'there is an improvement in communication with my child because before implantation it was difficult to deal with him. But 'thank God' there is an improvement in his understanding of our instruction and also we are able to understand him'.* One parent argues that their child is able to formulate appropriate words, and has enthusiasm in talking. However, another parent says that the intelligibility level of their child's speech is not satisfactory. Also, as an indication of the limited knowledge that could be gained by some pupils with CIs, one parent said *'although it is difficult for my child to learn all the school materials, at least he can learn some of them'.*

Teachers claim that imagination language learning, expressive language and vocabulary are aspects that can be enhanced by using CIs. One teacher argues *'Yes. CIs worked on improving more language imagination for deaf pupils and it is considered one of the most important aids'*. Moreover, easy responding and communication are themes that emerge within teachers' responses. Abandoning of sign language and acquisition of language and speech might be gained by a child with CIs. One parent claims that *'B has conversations even if they are short… I can say that his speech is improving'*. Also, both teachers and clinicians argue that enriching vocabulary and speech intelligibility could be gained.

iv) Psychological and social aspects

In respect to the psychological and social aspects that might have a relation with pupils' educational progress, it is claimed by parents, teachers and clinicians that these pupils are becoming more sociable and their positive attitudes are enhanced. One father say *'my child's is psychologically better', and 'I noticed that my child has a better attitude and has been reflecting effectively upon his performance'.* Thus, improving of social skills and positive attitudes are mentioned by participants as advantages of CIs. One teacher says, *'such intervention can encourage deaf students to do activities both inside and outside school'*. Another says *'a positive impact upon social dimension is creating a new life for my student'.* Also, it is claimed that CIs do not have side effects upon the child. One father says that *'It does not cause any inconvenience for the child or headaches like normal hearing aids'.*

v) Independency

Independency, which is mentioned by parents only, might add an advantage to the CIs. One parent claims, *'there is a big difference before and after surgery for the better'*. Another says *'there has been a significant impact upon my child and our family as he is now able to hear people around him and for example the sound of cars, the telephone and door bells … It has had a big impact on my child's life'.*

vi) Inclusive education

Inclusive education attends clearly and significantly within participants' perceptions and experiences. Parents argue that CI would encourage inclusion for their children as a result of auditability and language improvement. As a result, one parent states that *'deaf pupil with CIs can deal with others in school normally'*. In addition, a teacher claims that *'CIs help deaf pupils to be included within the mainstream*

classroom so they benefit from their peers' language'. Also, a clinician argues *'students can proceed with their education through mainstream school'*.

However, participants argue that these advantages cannot be achieved unless the requirements are delivered and available. These requirements are early identification of deafness, early implantation (age of child), effective rehabilitation, and professional teachers and an effective educational environment. One parent argues that *'with an effective rehabilitation and training the desired goal is achieved'*. Another parent states *'CIs is very helpful but it needs professional teachers and an affordable rehabilitation programme'*. Also, one father says *'there is a significant positive impact but it needs intensive speech therapy'*. Teachers claim that such treatment would have significant advantages if conditions are applied and rehabilitation is provided. One teacher points out that *'it is suitable if the child has it at less than 5 years old and it depends on the effort that is provided for the child'*. Clinicians support this claim and state *'it is positive intervention if it is done at an early age'*.

Some participants emphasised the issue which could enhance having CI as early as possible. This issue is an awareness that is very crucial in order to discover cases early so that it has a significant positive impact upon educational level of the child with CIs. Teachers also argue that there are no disadvantages of the CI themselves but there are problems with other issues such as late implantation. In this case, father gives a clear instance by saying *'my child did not get much benefit because he had the surgery at a late age whereas his brother did because he got CIs earlier and currently he is in mainstream classroom'*. Further discussion regarding factors that might promote or hinder the implications for educational progress and inclusive education will be in the next chapter (Discussion).

Nevertheless, there are five (7.6%) teacher participants who claim that CIs have no advantages at all. Also, two parents (4.5%) did not respond to this question.

Regarding the second part of investigating the experiences and perceptions of participants towards CIs, the following section will highlight the disadvantages of CIs which are stated by parents, teachers and clinicians.

The disadvantages of cochlear implant upon the deaf pupil:

It is worth pointing out that there are common answers respect to the disadvantages of CI which are stated by parents, teachers and clinicians. Parents, teachers and clinicians state similar themes regarding the disadvantages of CI: the negative impact of CI upon the potential risk of surgery and family lifestyle, high cost of CI surgery and rehabilitation programmes and delay of language and academic attainment. However, there is a theme which is concern about the appearance of the CI device is mentioned by parents and teachers but not clinicians. The percentages of responses will be presented according to each theme.

The following table (82) shows the disadvantages of CI which are expressed by parents, teachers and clinicians. Each of these concerns will be discussed in more detail in this section.

Table 82: Disadvantages related to CI from parents of deaf pupils with CIs, teachers' and clinicians' experiences and perceptions

	Participants		
	Parents of deaf pupils with CIs	**Teachers**	**Clinicians**
Disadvantages	Risk from surgery: • It takes a long time of surgery procedure and tough effort. • Child is prevented some time from doing some activities or sports. • Young age of child could cause uncomfortable life situation for the family. • Causes concern for parents, so child does not fall, for example.	• Surgery successful percentage. • Pupil might lose his residual hearing if surgery was not successful. • Medical complications during surgery. • Restricts sports activities for the student. • It might cause bothering to student because of reverberation at the classroom.	• The impact of surgery upon the seventh nerve (nerves facials). • Discomfort of noise.
	Device and high Cost: • Expensive devices and replacement materials. • Cost of maintenance. • Faults that are exposed and dominating that is done by the agent of device.	• High cost of surgery • Needs backup equipment (batteries). • Difficulty of maintenance. • Time consuming maintenance as it takes a month in some cases.	• High cost of surgery.
	Rehabilitation programmes: • Expensive speech therapy and rehabilitation programmes.	• Difficulty of post rehabilitation. • It needs comprehensive language rehabilitation. • It needs very critical and consistent follow-up with speech therapist.	• Degree of commitment to the child rehabilitation sessions might results in low benefit. • The importance of post rehabilitation and family training which might be in some cases exhausting.
	Delay of language and academic attainment.	Delay of language and academic attainment.	Lack of clarity of speech, especially if it is unilateral implantation.
	Appearance: • The large size of the surgery and marks left by it.	Appearance: • Its obvious appearance. • Breakdowns and damage that happen to the device. • Its appearance may result in sarcasm from peers. • Excites curiosity of pupil's colleagues so this might affect his attention in lessons.	

i. The potential risk surgery and negative impact of CIs upon family lifestyle

Participants (13.6% (n=44) parents, 23% (n=65) teachers, 20% (n=10) clinicians) indicate disadvantages in terms of the negative impact of CI upon family lifestyle and risk of surgery. These disadvantages such as long-time of surgery procedure and tough effort, preventing the pupil doing some activities or sports and young age of child could cause uncomfortable life situation for the family. Also, pupil might lose his residual hearing if surgery was not successful and child might face medical complications during surgery. Moreover, CI might cause bothering to student because of reverberation at the classroom.

Teacher points out that variation between hospitals or centres which run such surgeries might have an impact upon the outcomes, claiming: *'I noticed that some of students feel very comfortable about CIs whereas others do not. Thus, as these students had the surgery at different hospital, I would recommend investigating the differences between hospitals which might cause this difference'*. Clinicians claim that *'there might be an impact from the surgery on the seventh nerve (nerves facials) but these consequences in our hospital are few'.*

ii. High cost

Parents of 28%, 12.3% of teachers and 20% of clinicians claimed that the high cost of surgery, expensive devices maintenance and replacement materials might be considered as disadvantages of such treatment.

iii. Rehabilitation programmes related issues

Rehabilitation programmes related issues were highlighted by participants. However, these issues were approached from different point of views. 47% of parents mentioned that high cost of such programmes might hinder the benefit of CI.

Whereas, 24% teachers said that CI needs comprehensive language rehabilitation which might be a significant disadvantages of CI. Also, 20% of clinicians argue that a degree of commitment to the child rehabilitation sessions might results in low benefit of CIs.

iv. Delay of language and academic attainment

Parents (6.8%) and teachers (12.3%) mentioned that there might be a delay in language and academic attainment. One parent claims that *'CI needs patience and parents should not expect immediate results after the implantation'*. Clinician (10%) stated that *'it might be a lack of clarity of speech, especially if it is a unilateral implantation*'.

v. *Appearance of device*

Appearance of device might be a disadvantage of having such treatment. Parents (10%) and teachers (9%) argue that this issue might cause sarcasm and curiosity from the pupil's peers. Also, the large size of the surgery and mark left by it is claimed by some parents as a disadvantage.

Interviews

In addition to the completed questionnaires, interviews were held with 10 parents and 10 teachers of deaf with CI. Thematic analysis is conducted for investigating data. Themes emerging from the interview data are below.

Parents and teachers of deaf pupils with CIs

Parents were selected based on different educational settings of their children (Table 83). These settings are, hearing impaired classroom within mainstream school (5

parents), mainstream classroom (2 parents) and both deaf school and deaf classroom within mainstream school (3 parents) (See Methodology chapter for description of educational settings). Whereas teachers were as follows: seven teachers from hearing impaired classroom within mainstream school, three teachers from both deaf school and deaf classroom within mainstream school.

Table 83: Participants in interviews (parents and teachers of deaf pupils with CIs)

Educational settings	**Participants**			
	Parents of pupils with CI		**Teachers of pupils with CI**	
	n	**%**	**n**	**%**
Hearing impaired classroom within mainstream school	5	50	7	70
Mainstream classroom	2	20	-----	------
Deaf school / deaf classroom within mainstream school	3	30	3	30
Total	10	100	10	100

Parents of deaf pupils with CIs

Parents 70% (n=7/10) claim that CI can make an impact upon deaf pupils' educational progress and outcomes such as an improvement in language and speech intelligibility, improving reading comprehension and social communication compared to the situation before having such intervention or with deaf pupils without CIs. Whereas, 30% (n=3/10) of parents state that poor educational progress might occur after having CI.

However, all parents (n=10) highlight substantial issues that might affect children's education such as lack of professional teachers, the educational setting, and time of implantation and provision preschool educational services. These issues are considered, from parents experience and perception, as obstacles and could hinder

the benefit of CI. One father of a student at a hearing impaired classroom said *'school does not provide effective learning because of lack of professional teachers and also the learning and teaching aids'*. Also, another parent added *'the educational setting that is provided for my child is an exclusion rather than inclusion and he is being educated with students who have speech difficulties'*. This might not enhance vocabulary and speech intelligibility from this father's perception.

One father also pointed out that the time of implantation and provision of preschool educational services might have a significant impact in terms of a pupil's adaptation to the educational environment. Another father, whose child had CI at first year of primary school (six years old), argues,

> *'it was a very hard time (first three years of primary school) because the pupil was in rehabilitation status and appointments were being followed up; some of teachers are not specialists; there is a difficult and intensive curriculum and lack of speech therapists at school and assistant learning and teaching aids'*.

This might indicate that having CI within school age might cause learning difficulty.

One parent states despite the level of pupil education might not be as desired, child's interaction with his hearing peers and participating in school activities could be improved. He stated, *'although my child is making slow progress, he interacts and communicates very well with peers in different activities'*. Nevertheless, a parent of a pupil with CIs who studies in a mainstream classroom said *'my child is making poor educational progress'*. By asking this father about the reasons for such poor educational progress of the pupil, he argues *'lack of speech therapists at school and a teacher who is unable to teach pupils with CIs. Also, the curriculum should be flexible. For instance, in reading and writing skills requirements and exam conditions'*. More data regarding factors that might promote the benefit of CI will be presented within this chapter.

It is important to point out that although there are variations in parents who their children study either in as part time in mainstream classroom or hearing impaired classroom, all parents who are their children study at deaf school or deaf units have presented a negative perception regarding the outcomes of CI.

Teachers of deaf pupils with CI

Teachers (70%, n=7/10, six teachers work at hearing impaired classroom and one teachers at deaf school) state that deaf pupils have positive outcomes of CI in terms of educational progress, educational approach and educational settings. It is claimed that *'these pupils are making better educational progress than deaf pupils without CI'*. Also, one teacher argues that *'the learning approach in terms of acquisition and modification of knowledge and skills has been changed'*. Another teacher states, for example, *'these pupils are currently using an oral approach as much as they can, rather than sign language'*. Moreover, it is pointed out that *'the educational and psychological impact has been changed positively'*.

With respect to educational settings or inclusive education, it is argued that CI can enhance the likelihood of obtaining a desirable education setting. It is claimed that *'such intervention allows deaf pupils to study in a hearing impaired classroom rather than a deaf school or deaf classroom'* (more data regarding inclusive education will be presented later in this chapter). However, 40% (n=4, three teachers work at deaf school and one teacher work at hearing impaired classroom) of teachers indicate a moderate educational level and variations between pupil interactions with each other. Therefore, theses pupils with CIs who their educational level might be poor would not be able to be included within mainstream classroom. One teacher says *'the difference between their performances in subjects relies on language ability*

such as reading and writing and those subjects like Math or Science where students do much better'. Also, it is claimed that *'pupils who were identified earlier as having deafness are better than those who were not'*. Further data regarding factors that might affect the educational progress will be presents in this chapter.

Teachers notice that some deaf pupils with CIs, who study at deaf classroom, are confused between using sign language and verbal language. One teacher says *'because in deaf classroom the main communication tool is the sign language, these pupils have confusion between using sign language and verbal language; I believe that educational progress depends on pupil's language and thus the surrounding environment should enhance this language'*. Another teacher comments that *'most importantly, as child has CI, the parents should practise the oral approach in order to communicate with their child rather than using sign language''. It is argued that 'school and home should unite their efforts'*.

Nevertheless, one teacher blamed some parents in terms of the poor education of deaf pupils with CIs. It is pointed out that there is a lack of parents' awareness. Another teacher commented *'unfortunately I believe that there is a lack of parents' awareness which should exist before their child undergoes surgery'*. Also, it is mentioned that sometimes parents do not play the required role either because of lack of awareness or just being too busy with other commitments.

However, one teacher says that *'parents should not be blamed because they might not have been delivered the required information and instructions and also have not been involved in training courses'.*

One teacher mentions that different speaking accents of teachers might have an impact upon pupils' understanding and comprehension. Also, regarding the device

itself, it is noticed that both school and family struggle with device maintenance. One teacher says *'if the device is damaged, pupil would not benefit from it'*. As mentioned in the disadvantages of CIs section, it is argued that such devices do require expensive maintenance.

Private and public school and male and female teachers

This is in respect to differentiating between private and public school and male and female teachers which should be taken into account in terms of enhancing educational progress for deaf pupils with CIs. One parent claims that

'with private school, my child was performing perfectly because: The number of students in class was very limited (5 pupils), there was a speech therapist, both the teacher and speech therapist were female. I can give this school an evaluation of 7/10. Whereas, in public school whether mainstream or a hearing impaired classroom is significantly weak. There is no care either by teachers or the local education authority. I can give this school an evaluation of 3/10'.

From the later quotation (parent's experience and perception), it can be seen that advantages of limited number of students at classroom, availability of professionals and female teachers could enhance pupil with CIs educational progress. Also, private schools in Riyadh might have a benefit as these advantages are available. One parent, however, who has both male and female children with CIs, describes his experience with his daughter's female school as *'significantly disappointing'* as deaf males are educated totally differently compared to deaf females. He provided many issues regarding this difference as follows, which all apply to the female school whereas male schools are not:

- Although inclusive education is a desirable educational setting, the parent is dissatisfied as his daughter is being educated within a mainstream classroom which has forty students, with deaf daughter isolated in a corner with five other hearing-impaired pupils as a group.

- There are no educational plans in terms of lessons and time management, resulting in significant pressure being put upon deaf pupils.
- There is a lack of diligence and attention and it is very difficult to contact the school. Also, school communication with families is rare.
- There is a lack of follow-up that should be made by the school. For instance, if a pupil is absent, the school would not ask about the girl regarding this absence even if it was for a whole day or more than a day.
- There is frequent disputing between parents and the school as a result of complaints.

There is an agreement between parents and teachers with respect to the current situation and the challenges that might face the pupils with CIs at school. It seems that there is a lack of rehabilitation programmes in terms of specialists and centres and pre and post implantation rehabilitation. Although it is claimed that Riyadh as a capital city has somewhat an advantage regarding the availability of rehabilitation programmes, one teacher says 'there is a lack of speech therapists in Riyadh'. Also, teacher says 'There is a long waiting list in order to get the desired service which is a few sessions for a short period'. Therefore, the teacher argues 'it is worth pointing out that school is an education and learning association more than a rehabilitation centre. Thus, teachers might face obstacles dealing with pupils with CIs who have not been auditory prepared and trained effectively'. Another teacher says 'CIs have either no impact upon educational progress or only a small impact. The reason for this conclusion is that there is lack of post implantation rehabilitation'.

Furthermore, teachers argue that having CI at a late age and during the time pupils are studying in school could cause difficulty in terms of their educational progress. It is claimed that 'deaf pupils who had CI after five years old are struggling with

language acquisition and an inability to be included within the mainstream school'. Another teacher argues that 'pupils, who had this treatment at a late age, have been struggling during their studying as they did not build up vocabulary help them catch up while they are at school'. However, it is claimed that there are different results between surgeries before five years and now. For instance, one teacher claims that 'in the past most of surgeries were performed at a later age of the child. Whereas, currently, implantation is being run earlier. Therefore, outcomes of these surgeries are better'.

5.3.2.2 Differences between Deaf Pupils with and without Cochlear Implants in their Educational Progress based on School Academic Results

Quantitative data that were collected through questionnaires where parents were asked to provide information on their child's school attainments from the academic report provided by the school. The aim of collecting such results is to explore the differences in the educational progress of deaf pupils with/without cochlear implants at primary school. Thus, according to the academic (school) reports, first, an overview regarding the educational performance of all deaf pupils with CI involved in this study (n=44) and relationship between different variables and their attainments will be highlighted here. Then, attention is turned to the differences between deaf pupils with/without cochlear implants in their educational progress based on school academic reports will be explored. However, this difference was mad only by a matching amongst pupils involved in this study between deaf pupils with/without CI who are 10-11 years old and in year five at primary school.

The Saudi national student evaluation system (Ministry of Education, 2013), standardised for use in primary schools, was used in order to identify differences

between pupils with/without CIs in terms of their educational progress in all subjects. As mentioned previously, the level of the student in the subject is assigned marks from 1 to 4 (Table, 84).

Table 84: The symbols indicate attainment scale in the subject

Symbols /Grades	**Attainment scales**
Mark (1)	The student has mastered all the skills prescribed in the course
Mark (2)	The student mastered 66% of the prescribed skills or more including the minimum required skills
Mark (3)	The student mastered at least the minimum required skills
Mark (4)	The student has not mastered all the minimum required skills

Figure (5) indicates the mean of the educational performance of deaf pupils with CI, who involve in this study, in every subject at primary school. From this figure it can be seen that the mean of results is between marks number one (the student has mastered all the skills prescribed in the course) and two (the student mastered 66% of the prescribed skills or more including the minimum required skills). PE and Art have best mean school results whereas Religious Education has the weakest compared to other subjects. Also, Science and Social Science have the same level of performance mean. With respect to Maths and Reading and Writing subjects, the mean of pupils with CIs is above 1.5. This means that the range of pupils' performance is between mastering 66% and all skills required in these subjects.

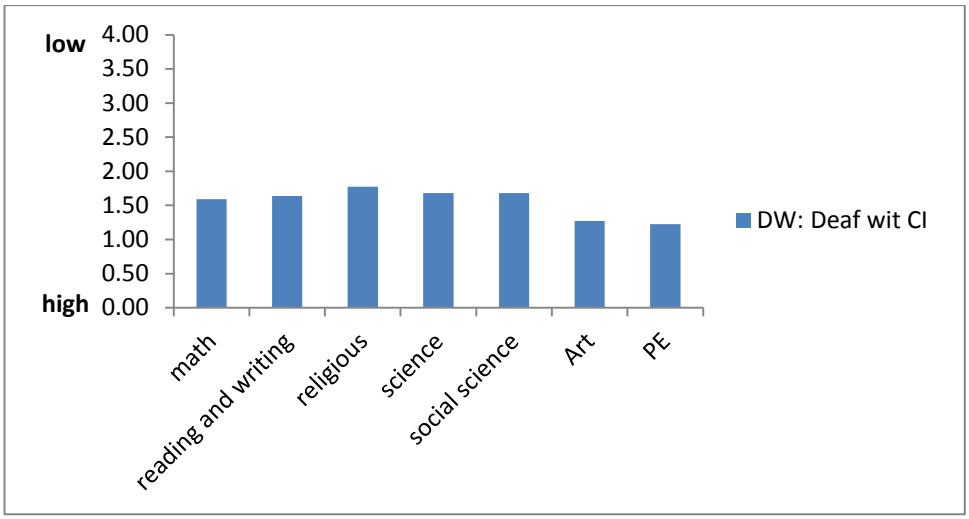

Figure 5: Educational performance of deaf pupils with CI at primary school

Table (85) presents the percentage of performance in all subjects according to the different attainment scale at primary school. It can be seen that in all subjects, between 47.7 % and 86.4% of deaf pupils with CIs have mastered all skills. PE and Art have the highest percentage of pupils who have mastered all skills with 86.4% and 81.8 of pupils respectively. Maths and Reading and Writing also have 63.6% and 59.1% respectively which are considered high percentages compared to other pupils' percentages at lower attainments scales. In addition, the highest percentage of pupils who have not mastered all skills including the minimum skills required was in Religious Education with 11.4% of pupils.

Table 85: The percentage of performance by subject at primary school

Group	Attainment scale	Maths	R&W	RE	S	SE	Art	PE
Deaf pupils with CI	Master all skills	63.6%	59.1%	52.3%	54.5%	47.7%	81.8%	86.4%
	Master 66% skills including minimum required	22.7%	22.7%	29.5%	29.5%	40.9%	11.4%	6.8%
	Master at least minimum required skills	4.5%	13.6%	6.8%	9.1%	6.8%	4.5%	4.5%
	Has not mastered all the minimum skills required	9.1%	4.5%	11.4%	6.8%	4.5%	2.3%	2.3%

Relationship between variables and educational performance

Variables such as the time of implantation, Parents expectations and their pupils educational performance, father's and mother's hearing level, the number of deaf family members, early intervention, period of using microphone and sound processor (external device) at school, communication approaches and educational settings have been taken into account in this study. Cross tabulation was used to examine pupils' educational performance in different subjects in order to identify whether there are relationships between these variables and educational attainment. In other words, it is aimed to identify the level of this attainment according to each variable. Maths and Reading and Writing subjects are selected to be involved in such examination, because these two subjects are considered as the main area of learning, as well as including variation of learning skills and ability.

Age at implantation

Investigation was undertaken in order to examine link between the age of deaf pupils at implantation and the impact upon the educational progress. An illustration of this is that whether current academic year for students who had CI is the supposed academic year according to student's age. There are two stages regarding the age at which pupils had the surgery. The first stage is pupils who have CI at the age of four years or less. Whereas, the second stage is pupils who have CI at more than four years old. The following tables (86, 87) show current academic year for students, in this study, who had CI at four years old or less/more and the supposed academic year according to student's chronological age.

Table 86: Current academic year for students who had CI at four years old or less and the supposed academic year according to student's age

No	Age at implantation (years)	Student age	Current classroom year	Year for chronological age
01	4	11	Year Five	Year Five
02	1	7	Year Two	Year Two
03	4	12	Year Six	Year Six
04	2	6	Year One	Year One
05	2	7	Year Two	Year Two
06	3	7	Year Two	Year Two
07	3	9	Year Three	Year Three
08	1.5	9	Year Three	Year Three
09	2	8	Year Two	Year Three
10	3	12	Year Five	Year Six
11	3	7	Year Two	Year Two
12	3	11	Year Four	Year Five
13	1	7	Year One	Year One
14	1.5	8	Year Three	Year Three

- Pupils who are studying in their expected year for chronological age.
- Pupils who are studying in the year below the year that they are supposed to be at.

From the Table (86), it can be seen that 32% (n=14/44) of pupils with CI had this treatment at the age of four or less. Importantly, the percentage of deaf pupils with CI who is at the expected classroom year is 79% (n=11/14). Whereas, the rest of the pupils (n=3/14, 21%) are studying in the year below the year that they are supposed to be at for their chronological age.

Table 87: Current academic year for students who had CI at more than four years old and the supposed academic year according to student's age

No	Implantation age (years)	Student age	Current classroom year	Year for chronological age
01	6	11	Year Four	Year Five
02	6	8	Year One	Year Three
03	6	11	Year One	Year Five
04	5	10	Year Two	Year Four
05	6	7	Year Two	Year Two
06	7	11	Year Three	Year Five
07	5.5	11	Year Three	Year Five
08	4.5	13	Year Six	Secondary school (first year)
09	5	11	Year one	Year Five
10	5	7	Year One	Year Two
11	14	14	Year Four	Secondary school (second year)
12	4.5	12	Year Four	Year Six
13	6.5	16	Year Six	High school (first year)
14	6	13	Year Six	Secondary school (first year)
15	5	11	Year One	Year Five
16	7	11	Year Three	Year Five
17	5	9	Year One	Year Three
18	5	13	Year Five	Secondary school (first year)
19	5	12	Year Five	Year Six
20	8	9	Year Two	Year Four
21	4.5	11	Year Three	Year Five
22	4.5	11	Year Three	Year Five
23	5.5	8	Year One	Year Three
24	5	11	Year Four	Year Five
25	5	11	Year Five	Year Five
26	4.4	8	Year One	Year Three
27	7	14	Year Five	Secondary school (second year)
28	6	12	Year Five	Year Six
29	7	13	Year Six	Secondary school (first year)
30	9	11	Year Four	Year Five

- Pupils who are studying in their expected year for chronological age.
- Pupils who are studying in the year below the year that they are supposed to be at.
- Pupils who are studying in the year below (2 years or more difference) the year that they are supposed to be at.

From the Table (87), it can be seen that 68% (n=30/44) of deaf pupils with CI had this treatment at the age of more than four years old. Importantly, the percentage of these pupils (n=19/30, 63%) are studying in the year below (2 years or more difference) the year that they are supposed to be at for their chronological age. Also, (n=9/30, 30%) are studying in the year below (1 year difference) the year that they are supposed to be at. Whereas, the percentage of these pupils who is at the expected classroom year is 6.6% (n=2/30).

Parents expectations and their pupils educational performance

The educational performance in Maths and Reading and Writing subjects were examined in the light of parents expectations. Crosstabs were conducted in order to observe the educational performance in these subjects according to parents expectations.

Table 88: The educational performance in maths and parents' expectations

Subject	**Attainment scale**	**Parents expectations**		**Total**
		High level	**Moderate + Low**	
Maths	Master all skills	14 (66.6%)	14 (60.8%)	28
	Master 66% skills including minimum required	4	6	10
	Has not OR mastered the minimum skills required	3	3	6
	Total	21	23	44

Table (88) shows that the higher percentage (66.6%) of pupils who have mastered all skills in Maths was for pupils whose parents' expectations were in high level. However, the difference between two groups might be not substantial as it is only (6%).

Table 89: The educational performance in reading and writing, and parents' expectations

Subject	Attainment scale	Parents expectations		Total
		High level	Moderate + Low	
Reading & Writing	Master all skills	13 (61.9%)	13 (56.5%)	26
	Master 66% skills including minimum required	4	6	10
	Has not OR mastered the minimum skills required	4	4	8
	Total	21	23	44

Table (89) shows that the higher percentage (61.9%) of pupils who have mastered all skills in Reading and Writing was for pupils whose parents' expectations are in high level. However, the difference between two groups might be not substantial as it is only (5.5%).

Table (90) and (91) show cross tabulation of variables of the time of father's and mother's hearing level, the number of deaf family members, early intervention, period of using microphone and sound processor (external device) at school and communication approaches which are used to examine pupils' educational performance in the subjects of Maths and Reading and Writing. As mentioned earlier, this examination might help to identify whether there are relationships between these variables and educational attainment.

Table 90: Variables and deaf pupils with CI academic performance in maths

Variables		Maths (figures are number of pupils)				
		Mastered all the skills	**Mastered 66% of the prescribed skills**	**Mastered at least the minimum required skills**	**Has not mastered all the minimum required skills**	**Total**
Father's hearing	Normal	26	9	2	3	40
	Profoundly deaf	2	1	0	1	4
Mother's hearing	Normal	28	10	2	3	43
	Profoundly deaf	0	0	0	1	1
More than one member of deaf in family	Yes	17	4	0	1	22
	No	11	6	2	3	22
Early intervention	Yes	20	7	1	3	31
	No	8	3	1	1	13
Using hearing aid all school day	Yes	28	9	0	4	41
	No	0	0	1	0	1
	Part of day	0	1	1	0	2
Communication approach	Sign language	3	1	1	2	7
	Total communication	16	5	0	1	22
	Oral audio	9	4	1	1	15

Table 91: Variables and deaf pupils with CI academic performance in reading and writing

Variables		Reading and Writing (figures are number of pupils)				
		Mastered all the skills	**Mastered 66% of the prescribed skills**	**Mastered at least the minimum required skills**	**Has not mastered all the minimum required skills**	**Total**
Father's hearing	Normal	24	9	6	1	40
	Profoundly deaf	2	1	0	1	4
Mother's hearing	Normal	26	10	6	1	43
	Profoundly deaf	0	0	0	1	1
More than one member of deaf in family	Yes	13	8	0	1	22
	No	13	2	6	1	22
Early intervention	Yes	20	6	4	1	31
	No	6	4	2	1	13
Using hearing aid	Yes	26	9	4	2	41
	No	0	0	1	0	1
	Part of day	0	1	1	0	2
Communication approach	Sign language	3	0	2	2	7
	Total communication	13	6	3	0	22
	Oral audio	10	4	1	0	15

Father's hearing

The percentage of pupils who achieved all skills required in Maths and Reading and Writing is 65% (n=26/40) and 60% (n=24/40), respectively, for pupils whose father's hearing level is normal; while 7.5%(3=40) of these students in Maths, and 2.5%(n=1/40) in Reading and Writing, have not mastered the minimum required skills in such subjects. Regarding deaf fathers, their children have mastered all skills with 50% (n=2/4) in Maths and Reading and Witting. However, it is crucial to point out that the number of participants (deaf pupils with CIs) whose fathers are profoundly deaf is a limited number (n=4), whereas, the number of deaf pupils with CI whose father's hearing level is normal is (n=40).

Mother's hearing

The percentage of pupils who achieved all skills required in Maths and Reading and Writing is 65% (n=28/43) and 60% (n=26/43), respectively, for pupils whose mother's hearing level is normal, while 7% (n=3/43), in Maths, and 2.3% (n=1/43), in Reading and Writing, of these students have not mastered the minimum required skills in such subjects. Regarding deaf mothers, however, it is important to point out that the number of participants (deaf pupils with CI) whose mothers are profoundly deaf is a limited number (n=1), whereas, the number of deaf pupils with CIs whose mother's hearing level is normal is (n=43).

Number of deaf in family

Regarding pupils whose family has more than one deaf member, the percentage of these pupils who achieved all skills required in Maths and Reading and Writing is 77% (n=17/22) and 59% (n=13/22), respectively, whereas, the percentage of other pupils who do not have another deaf member in the family is 50% (n=11/22) in

Maths and 59%(n=13/22) in Reading and Writing. Moreover, the percentage of pupils who have not mastered all required skills in Maths is 4.5% (n=1/22) for the group with more than one deaf member, while, the percentage is trebled, 13.6% (n=3/22), for students who are from families that have just one member. In Reading and Writing, the percentage of pupils who have not mastered all required skills is same (4.5%, n=1/22) for both groups.

Early intervention

Regarding pupils who have been provided an early intervention programme, the percentage of these pupils who achieved all skills required in both Maths and Reading and Writing is 64.5%(n=20/31), whereas, the percentage of other pupils who have not had such intervention is 61.5% (n=8/13) in Maths and 46% (n=6/13) in Reading and Writing.

Using microphone and sound processor (external device) at school day

This variable concerns the period of using the sound processor during the school day to aid their hearing. The percentage of pupils who use this device for the whole school day and have mastered all required skills in Maths is 68.2% (n=28/41) and 63.4% (n=26/41) in Reading and Writing. Whereas, pupils who use the sound processor either part-time or never, have not mastered all required skills in neither Maths nor Reading and Writing. However, the number of pupils who use the sound processor either part-time or never is three pupils (6.8%).

Communication approach

There are three types of communication approaches that are used by the pupils in the study: sign language, total communication and oral audio. Parents of deaf pupils

with CIs have indicated which type is used at school in communicating with the pupil. In Maths, 72.7% (n=16/22) of pupils who use the total communication approach have mastered all required skills, in contrast to 60% (n=9/15) of pupils who communicate using oral audio and 42.8% (n=3/7) of those who use sign language. In addition, 28.5% (n=2/7) of pupils who use sign language have not achieved the minimum required skills. This might be a high percentage compared with the percentage of pupils who use the total communication approach and also percentage of pupils who use the oral audio approach which are 4.5% (n=1/22) and 6.6% (n=1/15) respectively at such level of attainment.

With respect to Reading and Writing, the percentage of deaf pupils with CI who use the oral audio approach and mastered all the required skills is 66.6% (n=10/15) which is higher than the percentage of both other groups (deaf pupils with CI who use either sign language approach (n=3/7, 42%) or total communication approach (n=13/22, 59%). Also, 28.5% (n=2/7) of pupils who use sign language have not achieved the minimum required skills, while no pupil was registered at this level of attainment from both other groups (deaf pupils with CIs who use either sign language approach or total communication approach).

The differences between deaf pupils with/without cochlear implants in their educational progress based on school academic reports:

In this section, as mentioned, quantitative data that were collected through questionnaires where parents were asked to provide information on their child's school attainments from the academic report provided by the school. The aim of collecting such results is to explore the differences in the educational progress of deaf pupils with/without cochlear implants at primary school. The levels of the student in the subject are assigned marks from 1 to 4 (Table, 92).

Table 92: The symbols indicate attainment scale in the subject

Symbols	Attainment scales
Mark (1)	The student has mastered all the skills prescribed in the course
Mark (2)	The student mastered 66% of the prescribed skills or more including the minimum required skills
Mark (3)	The student mastered at least the minimum required skills
Mark (4)	The student has not mastered all the minimum required skills

First, the comparison of the educational performance will be through mean of all pupils' academic results in each subject for both groups. Second, the performance (frequency, percentage) of both groups in each subject according to attainment scales (Table, 24) will be presented. The following Figure (6) shows mean differences between deaf pupils with/without CI in attainment in Maths, Reading and Writing, Religious Education, Science, Social Education, Art and PE.

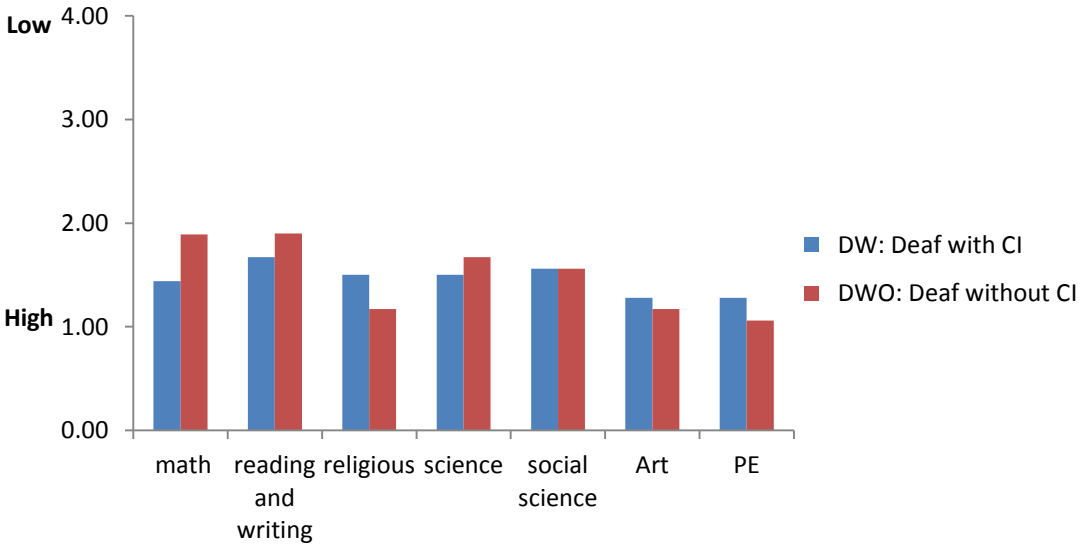

Figure 6: Progress differences between deaf pupils with/without CI

As mentioned, mark (1) represents high achievement whereas mark (4) is low or poor attainment. The values in between them indicates the level of performance depends on whether they are close to the higher or lower marks. From figure (6),

there are differences between their mean of results in all subjects. It can be seen that although pupils with CI are at a relatively average level in mathematics with mean of (1.44), reading and writing (1.67), and science (1.50) their mean school results are still higher than pupils without CI. However, the latter group has higher achievement in religious with mean of (1.17). Moreover, it is worth pointing out that there are no differences between both groups in their mean school results in the social education. Art and PE subjects, differences seem to be in favour to pupils without CI.

The following tables show the performance (frequency, percentage) of both groups in each subject according to attainment scales (Table, 92). The key finding is that the percentages of pupils with CI who mastered all skills in subjects of Maths, Reading and Writing and Science, are higher than the percentages for pupils without CI. However, in Religious Education, Art and PE, the percentages of pupils without CI who mastered all skills are higher than the percentages for pupils with CI. Whereas, in Social Science, the performance for both groups has the same mean.

Moreover, Chi-Square analyses was undertaken to examine whether there is a significant difference in different subjects performance between two groups. There were not any statistically significant at level 0.05 in all subjects.

Table 93: Educational progress in maths

Group	**Attainment scale**			
	Master all skills	**66%**	**Min or None**	**Total**
Deaf pupils with CI	12 (66.6%)	2 (11.1%)	4 (22.2%)	18 100%
Deaf pupils without CI	6 (33.3%)	8 (44.4%)	4 (22.2%)	18 100%

It can be shown that the percentage of deaf pupils with CI who mastered all skills in Maths is 66.6% which is higher than for deaf pupils without CI at 33.3%. Also, the majority of latter group have mastered 66% skills including minimum required. Chi-Square analyses (Table, 94) was undertaken to examine whether there is a significant difference in Maths performance between two groups. Findings were not statistically significant at level 0.05.

Table 94: Chi-Square Test for educational progress in maths

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	3.214	1	.073
N of Valid Cases	28		

Table 95: Educational progress in reading and writing

Group	**Attainment scale**			
	Master all skills	**66% of skills**	**Minimum skills or None**	**Total**
Deaf pupils with CI	10 (55.5%)	4 (22.2%)	4 (22.2%)	18
Deaf pupils without CI	6 (33.3%)	8 (44.4%)	4 (22.2%)	18

From Table (95) it can be seen that the percentage of deaf pupils with CI who mastered all skills in reading and writing is 555% which is higher than for deaf pupils without CI at 33.3%. Also, the majority of latter group have mastered 66% skills including minimum required. However, in both group, the percentage of pupils who mastered/not at least the minimum required skills is the same.

A Chi-Square analysis was undertaken (Table, 96) to examine whether there is a significant difference in reading and writing performance between two groups. Findings were statistically non- significant at level 0.05.

Table 96: Chi-Square Test for educational progress in reading and writing

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	1.429	1	.232
N of Valid Cases	28		

Table 97: Educational progress in religious education

Group	**Attainment scale**			
	Master all skills	**66% of skills**	**Minimum skills or None**	**Total**
Deaf pupils with CI	11 (61.1%)	3 (16.6%)	4 (22.2%)	18 100%
Deaf pupils without CI	13 (72.2%)	1 (5.5%)	4 (22.2%)	18 100%

From table (97) it can be seen that the percentage of deaf pupils without CI who mastered all skills in religious is 72.2% which is higher than for deaf pupils with CI at 61.1%. Also, the percentage of deaf pupils with CI who master 66% skills including minimum required is higher at 16.6%. However, the percentage of pupils who have /not mastered all the minimum skills required is the same of two groups.

Table 98: Chi-Square Test for educational progress in religious education

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	1.001	1	.317
N of Valid Cases	28		

A Chi-Square analysis was undertaken (Table, 98) to examine whether there is a significant difference in Religious Education performance between two groups. Findings were non statistically significant at level 0.05.

Table 99: Educational progress in science

Group	Attainment scale			
	Master all skills	**66%**	**Min or None**	**Total**
Deaf pupils with CI	10 (55.5%)	4 (22.2%)	4 (22.2%)	18 100%
Deaf pupils without CI	8 (44.4%)	6 (33.3%)	4 (22.2%)	18 100%

The table above (99) shows the educational progress for both groups in science. It can be seen that just over 55% of deaf pupils with CI master all skills in this subject which is higher than the percentage of the other group (44.4%). However, the percentage of both group who have/ not mastered all the minimum skills required is the same.

Table 100: Chi-Square Test for educational progress in Science

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	.259	1	.611
N of Valid Cases	28		

A Chi-Square analysis was undertaken (Table, 100) to examine whether there is a significant difference in Science performance between the two groups. Findings were statistically non- significant at level 0.05.

Table 101: Educational progress in social education

Group	Attainment scale			
	Master all skills	**66%**	**Min or None**	**Total**
Deaf pupils with CI	9 (50%)	5 (27.7%)	4 (22.2%)	18 100%
Deaf pupils without CI	9 (50%)	5 (27.7%)	4 (22.2%)	18 100%

Table (101) shows the educational progress for both groups in social education. It can be shown that the percentage of deaf pupils with/out CI who master all skills, who master 66% skills including minimum required and pupils who have /not mastered all the minimum skills required is the same of two groups.

A Chi-Square analysis was undertaken (Table, 102) to examine whether there is a significant difference in Social Education performance between two groups. Findings were statistically non- significant at level 0.05.

Table 102: Chi-Square Test for educational progress social education

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	.308	1	.579
N of Valid Cases	28		

Table 103: Educational progress in art

Group	Attainment scale			
	Master all skills	**66%**	**Min or None**	**Total**
Deaf pupils with CI	11 (61.1%)	3 (16.6%)	4 (22.2%)	18
Deaf pupils without CI	12 (66.6%)	2 (11.1%)	4 (22.2%)	18

The table above indicates the differences between two groups in Art. The performance of deaf pupils in both groups who master all skills in this subject is seen as the overall performances are relatively near each other.

A Chi-Square analysis was undertaken (Table, 104) to examine whether there is a significant difference in Social Science performance between two groups. Findings were statistically non- significant at level 0.05.

Table 104: Chi-Square Test for educational progress in art

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	.006a	1	.939
N of Valid Cases	28		

Table 105: Educational progress in PE

Group	Attainment scale			
	Master all skills	**66%**	**Min or None**	**Total**
Deaf pupils with CI	12 (66.6%)	2 (11.1%)	4 (22.2%)	18
Deaf pupils without CI	13 (72.2%)	1 (5.5%)	4 (22.2%)	18

Table (105) shows educational progress for both groups in PE. The performance of deaf pupils in both groups who master all skills in this subject is seen as the overall performances are relatively near each other.

A Chi-Square analysis was undertaken (Table, 106) to examine whether there is a significant difference in Social Science performance between two groups. Findings were statistically non- significant at level 0.05.

Table 106: Chi-Square Test for educational progress in PE

	Value	**df**	**Sig. (2-sided)**
Pearson Chi-Square	.007	1	.932
N of Valid Cases	28		

5.3.2.3 The perceptions and experiences of parents, teachers and clinicians regarding factors that could either reduce or promote the benefits of cochlear implants

This subsidiary research question focuses on the perceptions and experiences of parents, teachers and clinicians regarding factors that could either reduce or promote the benefits of cochlear implants. In addressing this question, parents, teachers and clinicians were asked to provide their degree of agreement towards a group of factors that were set within a Likert scale (quantitative data). Also, the perceptions and experiences of these participants were collected by interviews.

i. Parents, teachers and clinicians' degree of agreement towards a group of factors have been set within a Likert scale.

Table (107) shows the perceptions and experiences of parents (P), teachers (T) and clinicians (C) regarding factors that could either reduce or promote the benefits of cochlear implants. These factors comprise age at implantation, early identification of

deafness, rehabilitation programmes, family role and awareness, teamwork, presence of more than one deaf member in a family, communication approach, period of using microphone and sound process (external device) are involved.

These data were analysed by combining responses of Strongly agree with Agree and combining Strongly disagree with Disagree. The percentages of participants' responses for each factor are presented.

Table (107) shows the perceptions and experiences of parents (P), teachers (T) and clinicians (C) regarding factors that could either reduce or promote the benefits of cochlear implants.

Table 107: Perceptions and experiences of parents, teachers and clinicians regarding factors that could either reduce or promote the benefits of CI

No	Factor	Strongly agree+ Agree (%)			Neutral (%)			Strongly disagree+ Disagree (%)		
		P	T	C	P	T	C	P	T	C
1	Early age of pupil at cochlear implant surgery positively affects the benefit a student gets from it educationally	93	92.3	100	6.8	7.7	0.0	0.0	0.0	0.0
2	Early identify of the hearing impairment positively affects the benefit a student gains from cochlear implant surgery	90.9	89.2	100	4.6	6.2	0.0	4.6	4.5	0.0
3	Rehabilitation programmes (auditory, speech therapist etc) play an important role in the progress a student makes educationally and linguistically	97.7	100	100	2.3	0.0	0.0	0.0	0.0	0.0
4	Many beneficial rehabilitation programmes are available in Riyadh. They provide services to the child after the cochlea is implanted	38.7	16.9	90	20.5	49.2	10	40.9	33.8	0.0
5	School and rehabilitation centres provide the students and their parents with all the information related to the location and means of obtaining deaf rehabilitation services and those that provide speech training	38.6	33.9	70	36.4	41.5	30	25	24.6	0.0
6	The student and his parents have a clear idea about the nature of deaf rehabilitation and speech therapy services offered by the schools or the rehabilitation centres	59.2	24.6	60	22.7	49.2	30	18.2	26.2	10
7	Schools or the rehabilitation centres offer training programmes to the parents of the students who already have cochlear implants. The courses orient them on how they can deal with their sons and daughters psychologically, educationally and socially	34.1	23	60	18.2	18.5	40	47.8	58.4	0.0
8	Offering educational services to students who have already had a cochlea implanted via a team that has different specialties is a prerequisite for the student`s success	84.1	81.5	90	9.1	7.7	10	6.8	10.8	0.0

No	Factor	Strongly agree+ Agree (%)			Neutral (%)			Strongly disagree+ Disagree (%)		
		P	T	C	P	T	C	P	T	C
9	The student and his family should get involved in drawing up an educational plan which is offered to the student at school and rehabilitation centres. This is a prerequisite for the student`s success	84.2	86.2	80	11.4	9.2	20	4.5	4.6	0.0
10	The family of a student with a cochlear implant plays a significant role in developing his/her educational progress	97.8	95.4	100	2.3	4.6	0.0	0.0	0.0	0.0
11	Type and length of rehabilitation programme that supports educational services play a role in progress level of student with cochlear implant	100	96.9	90	0.0	3.1	0.0	0.0	0.0	10
12	From my experience, I can claim that the presence of more than one deaf individual in a family has a negative impact on performance of the student with a cochlear implant	66	38.5	60	20.5	40	20	13.7	21.5	20
13	Regulations issued by authorities that are concerned with providing rehabilitation, education and teaching services to students with a cochlear implant are effective in that they deliver required services adequately	36.4	18.5	50	22.7	44.6	30	41	36.9	20
14	Length of time using microphones (sound processor) plays an important role in the student's benefit from cochlear implants	95.5	86.1	90	4.5	12.3	0.0	0.0	1.5	10
15	Kind of approaches to communicate with student (total communication, use of sign language, audio-oral method) have a significant impact upon benefit of the cochlear	79.6	76.8	90	6.8	13.8	10	13.6	9.2	0.0
16	Disregarding sign language and relying on the audio-oral approach is the optimal method to enhance vocabulary and speech ability	91	73.8	60	4.5	15.4	40	4.5	10.7	0.0

Early age at implantation

The above table indicates that parents, teachers and clinicians generally agree that the early age at implantation positively affects the benefit a student gets from it educationally (93%, 92.3%,100% respectively).

Early identification of deafness

This high percentage of agreements, between 89% and 100%, is also registered by all participants for early identification of the hearing impairment which positively affects the benefit a student gains from cochlear implant surgery.

Rehabilitation programmes

A clear majority of parents (97.7%), teachers (100%) and clinicians (100%) agree that rehabilitation programmes (auditory, speech therapist etc) could play an important role in the progress a student makes educationally and linguistically. Also, parents (100%), teachers (96.9%) and clinicians (90%) agree that the type and length of rehabilitation programme that supports the educational services play a role in the progress level of students with CIs.

However, there are significant variations between participants' agreement about the availability and benefit of such rehabilitation programmes that can provide services to the child after the cochlea is implanted in Riyadh: 40.9% parents and 33.8% teachers disagree that such programmes are available in Riyadh, whereas 90% of clinicians agree. Also, 49% of teachers are neutral. In addition, just 33.9% of parents and 38.6% of teachers agree that school and the rehabilitation centres provide the students and their parents with all the information related to the location and means

of obtaining deaf rehabilitation services and those that provide speech training. However, 70% of clinicians agree that this kind of information is provided.

Moreover, it can be seen that the percentage of agreement towards the effectiveness of regulations issued by the authorities concerned with providing rehabilitation, education and teaching services, is not exceeded 50% by all participants.

Family role and awareness

With respect to family role and awareness, 59.2% of parents and 60% of clinicians agree that students and his parents have a clear idea about the nature of deaf rehabilitation and speech therapy services offered by the schools or the rehabilitation centres and the means of obtaining it. Whereas, only 24.6% of teachers agree with this statement. However, 58.4% of parents and 47.8% of teachers disagree that schools or rehabilitation centres offer training courses to the parents of deaf pupils with CIs. These courses could orient them in how they can deal with their sons and daughters psychologically, educationally and socially.

A high percentage (above 95%) of agreement is indicated by all participants regarding the family's significant role in developing the educational progress of deaf pupils with CIs. Therefore, 84.2% of parents, 86.2% of teachers and 80% of clinicians have agreed that students and families should get involved in drawing up an educational plan which is offered to students at school and rehabilitation centres. This is a prerequisite for the student`s success.

Teamwork

Regarding the teamwork approach, there is a high degree of consensus amongst parents (84.1%), teachers (81.5%) and clinicians (90%) that offering educational

services, via a team that has different specialties, to students who have a cochlear implants is a prerequisite for the student`s success.

The presence of more than one deaf member in a family

The presence of more than one deaf person in a family might affect the outcome of CI according to 66% of parents and 60% of clinicians who agree that such aspect has a negative impact on the performance of the student with a cochlear implant. However, 40% of teachers are neutral on this matter.

The period of using microphones (sound process)

The period of using microphones (sound process) seems to have an important role in the student's benefit from cochlear implants; 95.5% of parents, 90% of clinicians and 86.1% of teachers agree with such perception.

Communication approaches

Regarding communication approaches, 90% of clinicians, 79.6% of parents and 76.8% of teachers are in favour of a significant impact upon the benefit of the cochlear implant that could be implemented by the approaches that are used when dealing with students. With respect to the most likely type to be an optimal approach to enhance vocabulary and speech ability, 91% of parents and 73.8% of teachers agree that disregarding sign language and relying on the audio-oral system is the optimal approach. However, although the lowest percentage of agreement on this issue is for clinicians (60%), the rest of clinicians' percentage is neutral.

Factor analysis was undertaken to extract groups of factors. Table (108) shows total variance of items and Table (109) shows rotated component matrix.

Table 108: Total variance of items

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	4.284	26.775	26.775	4.284	26.775	26.775	2.847	17.792	17.792
2	2.770	17.315	44.090	2.770	17.315	44.090	2.645	16.528	34.320
3	2.315	14.469	58.559	2.315	14.469	58.559	2.336	14.600	48.920
4	1.071	6.694	65.254	1.071	6.694	65.254	1.831	11.445	60.365
5	1.028	6.424	71.678	1.028	6.424	71.678	1.810	11.313	71.678
6	.691	4.317	75.995						
7	.670	4.189	80.184						
8	.596	3.727	83.911						
9	.522	3.260	87.171						
10	.440	2.752	89.923						
11	.353	2.205	92.128						
12	.322	2.013	94.141						
13	.282	1.762	95.903						
14	.270	1.687	97.590						
15	.217	1.354	98.944						
16	.169	1.056	100.000						

Table 109: Rotated component matrix - rotation converged in five iterations

N	Component				
	1	2	3	4	5
1	-.062	-.099	.685	.057	.299
2	-.148	.085	.832	.010	-.065
3	-.035	-.065	.738	.290	.106
4	-.122	.846	.096	-.038	-.123
5	-.675	.528	.129	-.030	.155
6	.171	.694	-.074	-.164	.319
7	.484	.620	-.126	.131	-.237
8	-.268	.042	.248	.817	.050
9	.294	.016	.111	.852	.049
10	-.075	-.081	.535	.425	.411
11	-.067	-.078	.409	.306	.592
12	-.563	.307	.001	.103	.554
13	-.107	.793	-.113	.124	.064
14	.883	.036	-.106	.021	.002
15	.866	.138	-.099	-.032	-.276
16	-.245	.063	.146	-.036	.772

From the factor analysis it can be seen that five main dimensions could be extracted.

Item loadings for each factor > .30:

Table 110: Factor 1 (total variance 26%)

Dimension	No.	Items
Kind of communication methods and length of time spent using an external part in school.	1	The length of time spent using a microphone and sound processor (external part) in school.
	2	The kind of communication approach and its impact upon the benefits of cochlear implants.

Table 111: Factor 2 (total variance explained 17%)

Dimension	No.	Items
Rehabilitation programmes	1	Availability of effective rehabilitation programmes in Riyadh.
	2	Availability of information related to the location and means of obtaining deaf rehabilitation services.
	3	Recognition of relevance of deaf rehabilitation and speech therapy services by students and their parents.
	4	Availability of parents' intervention training programmes.
	5	Regulations issued by authorities that are concerned with providing rehabilitation, education and teaching services to students with CI.

Table 112: Factor 3 (total variance explained 14%)

Dimension	No.	Items
Early intervention and the role of the family.	1	Early identification of deafness.
	2	Early age at implantation.
	3	Providing rehabilitation programmes.
	4	Family role in developing the educational progress of pupils with CI.

Table 113: Factor 4 (total variance explained 6.6%)

Dimension	No.	Items
Teamwork approach.	1	Offering educational services to students via teamwork is a prerequisite for the success of students with CI.
	2	Involving students and their family in drawing up an Educational Plan that is offered to students at school and rehabilitation centres is a prerequisite for the success of students with CI.

Table 114: Factor 5 (total variance explained 6.4%)

Dimension	No.	Items
More than one deaf member of the family and the nature of the rehabilitation programme.	1	Role of the type and length of rehabilitation programme in enhancing CI outcomes.
	2	Impact of the more than one deaf individual in a family on the educational performance of students with CI.
	3	Disregarding sign language and relying on the audio-oral approach as a method of enhancing vocabulary and speech ability.

ii. Perceptions and experiences of parents and teachers of deaf pupils with CI by interviews.

In the latter section (i) factors that could affect the benefit of CI educationally such as age at implantation, early identification of deafness, rehabilitation programmes, family role and awareness, teamwork, presence of more than one deaf member in a family, communication approach, period of using the external device at school are examined.

In this section, factors which are related to school facilities, teaching and curriculum that could affect the benefit of CIs educationally from participants' experiences and perceptions will be presented. Different factors emerged during interviews which are related to professional staff and quality of teaching, curriculum, school, technology, FM system in the classroom and at home, universities and higher education role.

It is worth pointing out that these data are viewed by, the interviewees, both parents and teachers of pupils with CIs. However, variations in participants' perceptions and experiences regarding these factors will be highlighted.

Professional staff and quality of teaching:

Parents argue that teachers' fidelity and integrity might be a substantial aspect that could enhance deaf pupils with CIs learning. One father says *'fidelity and integrity must be present in the performance of the teacher. Teachers' performance is below average'*. Moreover, such a mission should be provided by a teacher who is able to teach pupils with CIs. One parent claims that *'professional teachers are needed urgently'*; 40% (n=4) of parents claim that teachers are weak, whereas 50% (n=5) say that there are variations in teachers' performance. One father says *'I believe that the teacher has a significant impact upon pupils' education. From my experience, there are variations in teachers' performance among schools'*.

Another parent argues *'these variations might refer to the qualifications and training that teachers have'*. Also, a teacher's personality and required skills should be taken into account in terms of the characteristics of a teacher who would take on the responsibility of teaching these pupils. One father argues that '*the teacher has a role in delivering knowledge and enhancing the recognition of sounds and words and*

connecting them to their meanings and resources for pupils with CIs. This learning method needs the teacher to be patient, calm and inventive'.

Therefore, it is argued that training programmes for teachers and speech therapists in dealing with pupils with CIs and their device is crucial. Such programmes can be provided by CI centres. Also, teachers should be provided intensive training courses in speech therapy. It is suggested by parents that courses abroad should be provided for teachers every year or two years, and also, professional experts should be recruited to evaluate and support teaching methods.

Teacher participants pointed out that there are requirements related to the quality of teaching. It is argued that *'A priority is for the presence of professional teachers to teach pupils with CIs which depends on the teacher's interest, ability, motivation and skills'*. Moreover, individual differences and variations among pupils should be considered in the educational process. Teacher said *'providing individual plans and considering different needs among the pupils with CIs is significantly required'.*

Teacher's key role v weak current situation: Teachers assume that there might be a link between weak pupils' educational progress and negative evaluation of current teachers' performance. It is claimed that *'there is a gap in teachers' ability to deal with pupils with CIs. There is an urgent necessity for teacher training'*. Also, team work which has professionals in different areas is claimed as a significant key in education. In terms of evaluating the current situation, it is said that *'there is a lack of specialists' team which includes different speciality needed to assist and support pupils with CIs'*. The importance of a speech therapist at school is highlighted by teachers. However, there is a lack of professional numbers in this field in Riyadh and in Saudi Arabia generally. One teacher argues *'unfortunately, the current evaluation*

of teachers is significantly negative because of lack of preparation and training and inadequacy in speech therapy skills'. However, a teacher argues that differences among teachers are based on their capability. Also, it is claimed that teachers cannot play this role alone without being within a team and being a partner in a comprehensive programme. It is suggested that training support should be provided by the Ministry of Education for training in efficient teaching methods.

Curriculum

Parents raise crucial issues that are related to the curriculum that is delivered to pupils with CIs. Data that will be presented include parents' experiences and perceptions regarding the current curriculums, seeking adapted curriculums and disagreement with special curriculums. It is claimed that the current curriculums are difficult for pupils with CIs. One father argues *'deaf pupils with CIs cannot understand the current curriculum because it is designed for hearing pupils'*. However, one parent points out that ability and individual differences should be taken into account in order to apply the current curriculums. It is claimed *'the current curriculum might be suitable but pupils' ability and individual differences should be considered by the teacher'*.

Therefore, 70% (n=7) of parents disagree with the special curriculum and 90% (n=9) seek an adapted curriculum. They agreed that an adapted curriculum should be implemented and the curriculum should focus on speech, vocabulary and inference (deductive) photos. One father says *'curriculums are appropriate but at the same time they should be adapted to be suitable for pupils with CI. For instance, mitigate them and minimise the required contents for pupils with CI. Also, skills which are needed for those pupils should be included'*. Moreover, it is claimed that it is

important to have additional curriculums along with the main one to understand and realise the words and their meanings; and also, to make connections between words and pictures, sounds and their sources.

Also, one parent argued that *'current curriculums need to be revised as their numbers are many (numerous) so pupils are being exhausted by them. However, I disagree with special curriculums but with mitigated current curriculums'*. Those who disagree with special curriculums argue that such curriculum might lead to exclusive education. One father says *'I am concerned that a special curriculum might lead to excluding them in special classrooms because the mainstream classroom provides the public curriculum'*. Also, one parent highlights *'I disagree with special curriculums and prefer that curriculums adapted by the teacher are provided and the required skills mitigated by the Ministry of Education to the minimum level'*.

The teacher participants, however, argue that conditions should be required in order that pupils can be educated by the inclusive education (mainstream) curriculum. These requirements are audibility based on rehabilitation and speech intelligibility. Also, teachers argue that bilateral implantation might have more impact than unilateral as pupils can identify sound directions (auditory localisation).

Therefore, the majority of teachers, also, share their agreements with parents in terms of implementing an adapted or adjusted curriculum; 70% (n=7) of teachers say additional material to the mainstream curriculum should be applied whereas 30% (n=3) mention that a special curriculum would be suitable for pupils with CIs. Rationale that makes teachers stand behind either point of views was discussed. Respect to mainstream (national) curriculums; teachers who support this perception

argue that adjusted curriculum as simultaneous additional curriculum to the (national) curriculums should be provided to these pupils. From these teachers perspective, such approach might help working on accelerating learning of pupils with CIs so they can catch up with their peers. Also, it could enhance pupil's ability to be prepared for future education (university). Nevertheless, teachers who suggest that special curriculums might be suitable for pupils with CIs, say that special curriculum should be applied as first stage before involving in inclusive education setting and having its curriculum. This because the absence of supporting and educational requirements which should be available currently in order to include these pupils within the mainstream classroom.

Moreover, it is claimed, the importance of creating effective teaching strategies and flexibility of curriculum and exams (as mentioned within parents' responses) might support implementing this curriculum and thus educational progress. Also, taking into account individual differences between pupils and distributing lesson time properly are highlighted.

It is worth pointing out that some teachers mentioned a possible connection between pupil's performance in the curriculum and inclusive education. It is argued that pupils with CIs should be in a hearing impaired classroom (integration) at primary school, then they could be moved to a mainstream classroom (inclusion). Because the nature of a hearing impaired classroom is having a limited number of students and a special teacher, this might allow implementing the adapted and additional curriculum.

School

Parents question that there are issues related to school that might have an impact upon the educational progress of pupils with CIs. It is claimed by father that creating an appropriate and effective school and preparing the classroom for pupils with CIs could enhance such progress. All fathers (n=10) argue that reducing the number of pupils in a classroom, the presence of a speech therapist at school, and school staff awareness of CI might be supportive of educational aspects. Also, the school being prepared in terms of facilities and the total number of pupils at the school should be taken into consideration.

The majority of teachers (n=8/10) argue that a committee should be established at the school in order to supervise pupils with CIs. Educational, psychological and technical roles can be implemented by such a committee. Moreover, it is highlighted that an effective relationship between school and home can enhance parents' role in following and educating their child. Thus, one teacher argues that school could play such a significant role by enhancing family awareness and providing training courses for parents in terms of learning about and dealing with pupils with cochlear implants, pre/post rehabilitation and regarding the device and how it can be protected. One teacher claims *'the school could help families in dealing with residual hearing and hearing that is created by CIs'*.

Technology: FM system in the classroom and at home

The majority of parents (n=7/10) argue that it is crucial that learning and teaching aids such as an FM system should be provided for their child at school. Teachers, also, reported that this resource would make communications easier and better and eliminate outside external influences from noise such as the high sound of air

conditioners which is located in every single room, either at school or at home due to the nature of the weather in Saudi.

All teachers (n=10) commented that issues that are related with the device itself can significantly and clearly affect the benefit of using CI; therefore, local authorisation and the teachers' role in keeping up with new technology mean that training courses should be provided in this field. For instance, teachers point out that such training could cover the FM system; microphone and sound processor, hearing aids; hearing impairment reports; changing the battery; checking whether the CI is working or not; checking the level of hearing and referring pupils to a specialist centre if any help is needed such as checking programming of CIs.

Coordination and connections between all of schools, hospitals, rehabilitation centres, and families could be substantial in order to achieve the desires educational progress. Teachers point out that coordination between hospitals that perform surgery, families and schools, especially audiologists, might be significant, because in many cases, school staff may not know whether a pupil's device is working properly or not. Most importantly, it would be a critical situation if the teacher expects the pupil to be listening when in fact he is not. Therefore, there has to be an emphasis on this aspect from the beginning. Moreover, the family, teacher and speech therapist should all be in agreement in terms of the teaching approach that using this technology.

The role of Universities and Higher Education

The lack of professionals who can work with pupils with CIs is argued to be one of the factors that could affect the outcome of CIs in Saudi. Parents suggest that in order to enhance the availability of professionals in Saudi, Universities and the Higher

Education sector should play actively in such a role. It is said that creating a speciality at universities and providing a specialised Diploma in this area might be a solution to the lack of specialists at schools and centres.

5.3.3 Third Research Question: To What Extent does CI Surgery Affect Educational Placement of Deaf Pupils at Primary Schools in SA?

In addressing this question, first, the perceptions and experiences of parents and teachers of deaf pupils with CIs regarding the impact of CI upon inclusive education for those pupils were collected by questionnaire (Likert scale). Second, interviews with these participants were implemented in order to explore the factors that might affect inclusive education for deaf pupils with CIs.

In next subsidiary, an overview of the current situation of education settings type before and after having CI, for deaf pupils with CIs who involved in this study, will be presented. This overview might help to perceive information regarding the improvement in inclusive education that is gained as a result of having CI.

5.3.3.1 What are the Current Types of Educational Setting for Pupils who Have CIs in Primary School in Riyadh?

The type of educational settings attended by deaf pupils before and after CI surgery will be highlighted. Next, the status of pupils at every setting type before having CI and then where they are moved to after such treatment will be presented.

Table 115: Educational settings type of deaf pupils before and after having CIs

Educational settings type	Before CI surgery	After CI surgery
Hearing impaired units at mainstream school	8 (18.2%)	28 (63.6%)
Hearing impaired units with part day at mainstream classroom	0 (0.00%)	4 (9.10 %)
Mainstream classroom	0 (0.00%)	0 (0.00%)
Deaf unit with part day in mainstream classroom	1 (2.2%)	1 (2.2%)
Deaf unit at mainstream school	1 (2.2%)	2 (4.6%)
Deaf school	5 (11.3%)	9 (20.5%)
Surgery before school age	29 (65.9%)	-------
Total	44	44

Table (115) presents the type of educational settings attended by deaf pupils involved in the study, before and after having CI surgery. It can be seen that the highest percentage of pupils had CI before school (65.9%). In addition, high numbers of pupils are being educated after having the surgery at hearing impaired units in mainstream schools. Whereas, the lowest is for deaf units in mainstream schools. It is important to point out that the mainstream classroom as education settings have not registered any pupil either before or after CI surgery.

The following tables show the status of pupils at every setting type before having CI and then where they are moved to after such treatment.

Table 116: Pupils who were educated at hearing impaired units at mainstream school

Before CIs		After CIs	After CIs	
Education setting type	n	Education setting type	N	%
Hearing impaired units at mainstream school	8	Hearing impaired units at mainstream school	5	62.5
		Hearing impaired units with part day at mainstream classroom	3	37.5
		Total	8	100

It can be seen that the education settings have not been changed for most of these pupils. However, 37.5% of them are being educated in the mainstream classroom for part of the day.

Table 117: Pupils who were educated in the mainstream classroom

Before CIs		After CIs		
Education settings type	n	Education settings type	N	%
Deaf unit with part day in mainstream classroom	1	Hearing impaired units in mainstream school	1	100
		Total	1	100

From table (117) It can be shown that the pupil has been moved from the mainstream classroom to hearing impaired units at mainstream school after having CI.

Table 118: Pupils who were educated at deaf unit at mainstream school

Before CIs		After CIs		
Education settings type	n	Education settings type	N	%
Deaf unit at mainstream school	1	Deaf unit in mainstream school	1	100
		Total	1	100

It can be seen from the above table that the education settings have not been changed for this pupil after surgery.

Table 119: Pupils who were educated at deaf school

Before CIs		After CIs		
Education settings type	n	Education settings type	N	%
Deaf school	5	Hearing impaired units at mainstream school	1	20
		Hearing impaired units with part day in mainstream classroom	1	20
		Deaf unit with part day in mainstream classroom	1	20
		Deaf school	2	40
		Total	5	100

From the above table it can be indicated that although 40% of these pupils are still at the same setting type, three pupils who were educated at deaf school have been moved to different educational settings.

Table 120: Pupils who had CI before school age

Before CIs		**After CIs**		
Education settings type	n	Education settings type	N	%
Surgery before school age	29	Hearing impaired units in mainstream school	22	75.8
		Mainstream classroom	0	0
		Deaf unit in mainstream school	0	0
		Deaf school	7	24.2
		Total	29	100

The majority of these pupils (75.8%), after having CI, studied at hearing impaired units in a mainstream school; whereas, the rest of the percentage (24.2%) studied at an exclusive education type which is a school for the deaf.

Procedures regarding educational placement

This issue is raised within interviews because participants indicated through their responses within the questionnaires that there are either obstacles or ambiguity when registering deaf pupils with CIs at a mainstream school. Thus, parents and teachers were asked about the process that is followed by parents, school and local authority when taking such decision.

According to a teacher who works with the Local Education Authority as coordinator supervisor, pupils with special needs are subject to diagnosing procedures. These procedures are implemented by either of the two following ways, and then based on test results; pupils are referred to the appropriate educational setting:

• Central committee which is located in Special Education Centre (Government centre). This committee includes a multi team (doctor, psychological specialist, special education teacher, speech therapist, audiologist, social worker, parent and his child).

•Admission Committee in schools which reports to local authority that makes decisions regarding pupil educational setting.

Seventy per cent (n=7) of parents state that they are aware that such decision is made by a special committee. However, 20% (n=2) of parents claim that there is an ambiguity of evaluation and diagnosing procedures and their sources. It is claimed that *'unfortunately, there is no specific and known association. Such issues rely on parents who do not have sufficient knowledge to raise awareness of evaluation and diagnosing procedures and sources'*. Moreover, fear of referring pupils with CIs to deaf school was noticed. One parent argues *'pupils with CIs must not be referred to deaf special school; rather they should be included within either hearing impaired classrooms or mainstream classrooms at public schools'*.

With respect to the basic rules which direct the decision, teachers argue that *'a pupil can be referred to the mainstream classroom if his language and speech are intelligible and efficient. This depends on the level of rehabilitation that he has received. Furthermore, time of implantation can play a significant role in enhancing inclusive education'*. Also, teacher who works as coordinator with the Special education centre which carries out on the evaluations tests and accordingly refer pupils to the appropriate education setting, stated that

'A pupil would be referred to hearing impaired class if his hearing level was average (mild)but he had a difficulties with language. Whereas, pupils would be referred to deaf units or school in these cases:

• *If his hearing audiogram shows that his hearing level is within deafness range.*

• *If he can hear sounds but without the ability to recognise their meaning and he has not sufficient vocabulary'.*

Development possibilities might be taken into account if conditions are applied. Teachers claim that

'A pupil could be moved from a hearing impaired classroom to a mainstream classroom whenever he shows academic and linguistic ability. A pupil in this case will be reassessed and then a decision would be taken whether or not inclusive education can be applied. However, evening rehabilitation lessons are too short and in a few cases, therefore, such improvement is unlikely to be acquired for most pupils'.

In this study, a limited number of pupils with CIs (5/44) who are educated part time of school day at mainstream classroom and there is no pupil from these students is included fully within mainstream classroom.

5.3.3.2 Perception and Experiences Towards the Impact of CI in Enhancing Inclusive Education for Deaf Pupils with CI

Within the questionnaire, Likert scale which comprise eleven items represent aspects of independency, participation and student voice (items 1-8), Academic ability (items 9-11) was used. Respect to independency, participation and student voice, for instance, pupil can develop good relationship with his peers, participate in school activities and express his needs inside school. While, academic ability means that pupil with CIs could improve his educational achievement effectively and ability of studying at mainstream classroom.

The idea is to what extent, from participants' experiences and perception, such aspects might be influenced by cochlear implants so that deaf pupils with CIs could be included in the mainstream classroom.

The following table (121) shows the level of agreements between parents and teachers of deaf pupils with CIs towards the impact of CIs upon these different aspects that could have an effect on enhancing inclusive education. In order to enhance clarity, Strongly agree and Agree are combined and Strongly disagree and Disagree also are combined.

Table 121: Level of agreement between parents and teachers regarding impact of CIs

No	Statement	Strongly agree+ Agree		Neutral		Strongly disagree+ Disagree	
		Parents	Teachers	Parents	Teachers	Parents	Teachers
1	Student with CIs can develop good relationships with his peers	39 88.7%	52 80%	4 9.1%	11 16.9%	1 2.3%	2 3%
2	Student with CIs could manage all his personal needs in school without outside help	40 90.9%	51 78.5%	2 4.5%	4 6.2%	2 4.5%	10 15.3%
3	Student with CIs can deal with daily problems he faces inside school	26 59.1%	29 44.6%	9 20.5%	22 33.8%	9 20.5%	14 21.5%
4	Student with CIs can exercises physical activities inside school	37 84.1%	54 83.1%	5 11.4%	6 9.2%	2 4.6%	5 7.7%
5	Student with CIs could competes in practising physical activities and games in school	34 77.3%	47 72.3%	7 15.9%	11 16.9%	3 6.8%	7 10.7%
6	Student with CIs could participates in educational and artistic programmes as extra- classroom activities	28 63.6%	32 49.3%	10 22.7%	18 27.7%	6 13.6%	15 23.1%
7	Student with CIs can expresses his educational needs inside school to his teachers and peers	33 75%	48 73.9%	10 22.7%	9 13.8%	1 2.3%	8 12.3%
8	Student with CIs can expresses his feelings inside school to his teachers and peers	39 66%	40 61.5%	12 27.3%	13 20%	3 6.8%	12 18.5%
9	By cochlear implants benefit, deaf student could improve his/her educational achievement effectively	39 88.7%	46 70.8%	5 11.4%	13 20%	0 0.0%	6 9.2%
10	By cochlear implants benefit, deaf student could study in a mainstream classroom along with his/her hearing peer	30 68.2%	23 35.4%	8 18.2%	25 38.5%	6 13.6%	17 26.2%
11	By cochlear implants benefit, and placing student in first row in classroom, student could enhance learning experience	40 90.9%	52 80%	4 9.1%	7 10.8%	0 0.0%	6 9.2%

Independency

From the table (121), it can be seen that high percentage of parents (n=39, 88.7%) and (n=52, 80%) of teachers agree that with help of CI, pupil can develop good relationship with his peers. Also, majority of parents (n=40, 90.9%) agree that CI can help pupil to manage all his needs in school without outside help. Although 78.5% (n=51) of teachers agree with this statement, 15.3% (n=10) of them disagree.

Regarding the statement that says student can deal with daily problems he faces inside school, 59.1% (n=26) of parents and only 44.6% (n=29) of teachers agree with such statement. However, compared with disagreement percentages of two statements that mentioned previously, both parents and teachers show high percentage of disagreement (parents 20.5%, teachers 21.5%) and neutrality (parents, 20.5%, teachers 33.8%).

Participation

A clear majority of parents (n=37, 84.1%) and teachers (n=54, 83.1%) agree that with help of CI student exercises his physical activities inside school. Also, student competes in practicing such activities with the help of CI as there is consensus of both parents (n=34, 77.3%) and teachers (n=47, 72.3%) regarding this issue.

Regarding the statement that says student participates in educational and artistic programmes as extra-classroom activities, 63.6% (n=28) of parents and only 49.3% (n=32) of teachers agree with such statement. However, compared with disagreement percentages of two statements that mentioned previously, both parents and teachers show high percentage of disagreement (parents, 13.6%, teachers 23.1%) and neutrality (parents, 22.7%, teachers 27.7%).

Student voice

75% of parents (n=33) and 73.9% of teachers (n=48) agree that with help of CI, student expresses his needs inside school to his teachers and peers. However, 22.7% of parents and 13.8% of teachers are neutral on this matter. Also, respect to the item that states student with CIs expresses his feelings inside school to his teachers and peers, 66% of parents and 61.5% of teachers agree on such statement. However, 18.5% (n=12) of teachers disagree on this issue.

Academic ability

The majority of parents (n=39, 88.7%) and high percentage of teachers (n=46, 70.85) agree that with the help of CI deaf pupil could improve his educational achievement effectively. Also, both parents and teachers with high percentages (90.9% and 80% respectively) agree that student could enhance learning experience by help of CI and pacing him at the first row in classroom. Moreover, it worth pointing out that parents' disagreement on these two items are 0%.

Respect to the statement that says by CI help, student could study in a mainstream classroom along with his/her hearing peer, there are a variation in participants responses. 68.2% (n=30) of parents and only 35.4% (n=23) of teachers agree on this matter, whereas, 26.2% of teachers and 13.6% of parents disagree. Also, there are relatively high percentages of teachers (38.5%) and parents (18.2%) are neutral on this matter.

5.3.3.3 The Perceptions and Experiences of Parents and Teachers Regarding the Role of the Educational Environment upon Inclusive Education for Deaf Pupils with CIs

In this question, the perceptions and experiences of parents and teachers towards factors related to the educational environment that could affect the inclusive education for deaf with CI will be undertaken. Also, interviews with parents and teachers of deaf pupils with CIs were conducted in order to explore reasons that made majority of these pupils being educated at non inclusive education settings. Themes emerges data will be discussed.

Pupils with CIs who are educated at hearing impaired classroom

The majority of pupils with CIs involved in this study are being educated at hearing impaired classroom at mainstream school. As mentioned previously within this section (inclusive education), although there is a consensus of participants towards the ability of studying in a mainstream classroom with the help of CI, the majority of parents and teachers prefer the impaired classroom as the educational setting for deaf pupils with CIs (Table, 122). The rational of this preferable educational setting will be presented later on this section. Also, it is stated that hearing impaired classroom setting should be implemented at the first phase of the pupil's school life, then the pupil can be transferred to mainstream classroom if his educational ability has improved.

Table 122: Preferred educational settings based on participants' experiences and perceptions

Preferred educational setting	Groups		
	Parents of deaf with CI	Teachers	Total
Mainstream classroom	11	10	21 (19.2%)
Hearing impaired unit at mainstream school	27	50	77 (70.6%)
Deaf unit at mainstream school	3	2	5 (4.5%)
Deaf school	3	3	6 (5.5%)
Total	44	65	109(100%)

Table (122) shows preferred education settings based on participation experiences and perceptions. It can be seen that the most preferred educational settings by both groups is hearing impaired unit (classroom) at mainstream school. Whereas, the option of deaf unit (classroom) at mainstream school has the lowest percentage (4.5%) for both groups.

Within the interviews, also, both parents and teachers emphasise this perception. Also, the rational of such perception was presented. A teacher says that *'pupils who have CI should be educated at hearing impaired classrooms in mainstream schools as the initialisation phase'*. One parent argues that

'Hearing impaired classroom is the best education setting for pupils with CI. Because all students in this class are similar in terms of speech level. Also, as it is just for specific students, there would be a focus on speech therapy in such education setting rather than in a mainstream classroom'.

Also, one father argues that *'I am not against mainstream classrooms but they are not prepared for pupil with CIs in terms of number of students in the classroom and facilities such as insulation and learning aids like the FM system'.*

Pupils with CIs who are educated in either a deaf unit or deaf school

The reasons behind pupils with CIs being educated at either deaf school or in a deaf unit attached within a mainstream school, rather than in an inclusive education setting, are presented here (Table, 123).

Table 123: Rationale for pupils with CIs who are being educated at special school/unit

No	Reasons	Explanations provided by participants (parents, n=10 and teachers, n=10)
1	Medical related reason	•Inability to cope with educational level requirements of either mainstream or hearing impaired classroom. Thus the pupil cannot benefit from CI because the child may not be medically eligible to have CI so this would not help (Medical error). Also, child's IQ might be under average. CI might be unsuccessful without telling parents about this issue. • Previous surgeries (five years ago) might be not accurate.
2	Lack of hearing and speech rehabilitation	•Because of the weakness of their academic level and language ability as a result of lack of an appropriate rehabilitation linguist. •Family is not responsible if child is unsuccessful. *'I believe that parents may not have a significant negative impact upon the child's weaknesses'*. However, difficulty of having effective rehabilitation might be the reason. •Hearing sounds is not the only indication of successful CI but also recognition of these sounds and understanding their meanings or concepts. •Either in contents of training or low number of specialists.
3	Late age of implantation	•The reason behind this is either lack of cochlear implantation awareness or due to long time waiting to obtain their turn in hospitals. •As a result, pupil might be at second or third year at deaf primary school. Confusion and fear whether surgery is successful or not. •Thus, the parent is in the critical situation of taking the decision to take their child off and may prefer to keep the child in his previous education setting. Implications of late age of implantation: •Weakness of vocabulary
4	Obstacles of inclusive education	Unprepared mainstream classroom in terms of: •Big number of students; •Non specialist teacher; •Inclusive education not activated. •Lower numbers of pupils in a classroom should be implemented. •Individual educational plan needed. •Preschool stage can play a significant role in enhancing inclusive education. •Because there is no collaboration between hospital and school. •Training courses (could be in evening) for teachers provided by hospitals. These courses could make teachers able to help family, who might not have awareness or ability, in dealing with their children.
5	Impact of social economic changes in the community	•Current surgeries are much better and they are performed at an earlier age so it is expected they will not be educated at deaf school. •Education level of parents. •Being most of the day time with a babysitter, who is not an Arabic speaker, or playing with electronic games would have a significant negative impact upon child language improvement.

School of deaf pupils with CIs role

Table (124) shows participants' responses regarding whether the current pupil's school embraces deaf pupils with CIs.

Table 124: Participants' responses regarding embracing school

Participants	Responses			
	Yes	Somewhat	No	Total
Parents	4 (40%)	2 (20%)	4 (40%)	10 (100%)
Teachers	0	3 (30%)	7 (70%)	10 (100%)
Total	4 (20%)	5 (25%)	11 (55%)	20 (100%)

One parent claims that *'schools are not prepared and adapted to embrace pupils with CIs in terms of facilities, equipment'*. Also, overcrowding at school and the fact that staff have not enough experience and knowledge of CI were argued by parents. One of them said *'They do not know what CI is about, from the head teacher to the school guard!'* One teacher points out that *'there is a significant number of pupils either in hearing impaired classroom (14 pupils) or mainstream classroom (40-45) pupils'*. However, one father states that *'from my experience of my child's school, I think that it is well prepared for having pupils with CI in terms of the building, number of students and how teachers are dealing with the pupils'*.

Another teacher argues that processing and special requirements are needed by students with CIs. He claimed that *'Although it has the potential and ability to provide these requirements, there are defect or failures in delivery of such necessities from the Ministry of Education'*. Moreover, another argued that *'some schools might have an appropriate educational environment but the majority are not appropriate and are unsatisfactory'*. A teacher says *'there is limited percentage of the provision of care and educational requirements, less than hoped!'* Also, another teacher says

'the educational environment is neglected, for instance, air conditioning noise is very annoying and disruptive for pupils with CI; also outside noise exists because there is no insulation of wall and floor within classrooms'.

Nevertheless, as one teacher pointed out, *'there are signs of movement towards providing all necessary requirements and changing and improving the current situation led by the Improving Education Association which has been established by the Ministry of Education'*.

Stigmatising behaviour and bullying in the classroom or within the school:

Within this issue, exploring bad behaviour and bullying in terms of whether such negative issues exist in schools and their impact upon inclusive education. Table (125) shows participants responses regarding to what extent such negative issues exist in schools.

Table 125: Participants agreement towards existing of stigmatising behaviour and bullying in the school

Participants	**Responses**			
	Yes	**Somewhat**	**No**	**Total**
Parents	1 (10%)	3 (30%)	6 (60%)	10 (100%)
Teachers	2 (20%)	3 (30%)	5 (50%)	10 (100%)
Total	3 (15%)	6 (30%)	11 (55%)	20 (100%)

Sixty per cent (n=6) of parents state that there is no bad behaviour or bullying at their children's schools. Whereas, 10% (n=1) claim that there is a kind of bullying of deaf pupils committed by the students. One said *'there is bullying in terms of taking the device off from my child; spilling water on his head; though playing'*.

Teachers argue that there might be stigmatising attitudes in school. It is argued that *'pupils with special needs face ridicule or sarcasm regardless their type of disability'*. However, it is claimed that *'the situation has changed between ten years ago and now. Bullying appears to be much less than before and programmes and intervention have been organised in order to tackle this issue, such as extra-curricular activities among all students'*. Furthermore, increasing awareness of the problem, a positive role of the special education teacher, the impact of increasing number of pupils who have CI might be considered as issues to counter this issue. Also, it is pointed out that there might be an impact of new versions of CI devices which are nicer in terms of their shape and appearance.

Next, data will be reported regarding helping pupils with CIs to be included within less exclusive educational environments (mainstream classroom, impaired hearing classroom in mainstream school) from the participants' experiences and perspectives.

Issues enhancing pupils with CIs to be included within less exclusive education environment (mainstream classroom, impaired hearing classroom in mainstream school):

Parents provide variations of requirements that could enhance inclusive education for deaf pupils with CIs. These requirements relate to either CI or school dimensions. Parents argue that early intervention through earlier age of implantation; early rehabilitation before school age; teacher ability and school facilities might all be key factors for inclusive education. One father says *'school must have professional teachers who know the characteristics of pupils with CI'*. Moreover, the importance of school staff awareness of CI, a speech therapist available at the school, the school being prepared in terms of facilities, and the total number of pupils within the school

were stated by parents. However, it is argued by one parent that *'creating and preparing an effective educational environment which is suitable for pupils with CIs is more important than considering whether it is inclusive or exclusive education'*. Teachers, also, indicate similar requirements related to the CI and school dimensions. In respect to the CI dimension, it is claimed that early identification of deafness, early intervention, early implantation and increasing number of specialist centres and professionals might help deaf pupils who have such treatment to be included within mainstream schools. This form could be either a mainstream classroom or hearing impaired classroom at a public school.

With respect to school dimensions, it is stated that individual educational plans, effective educational training for teachers, school staff awareness and efficiency skills such as (pre and post implantation rehabilitation) would be essential requirements for an inclusive school. Also, flexibility of regulations issued by the Ministry of Education might enhance such schools. For instance, a teacher argues that *'at exams, pupils with CI might be treated differently in terms of level questions and prepared and adapted locations'*.

In this chapter (Results), characteristics of participants and findings in relation to research questions were presented. Both quantitative and qualitative data were involved. Thematic analysis and SPSS were used in analysing different research questions. Within next chapter (Discussion), an interpretation of the key findings of this study will be presented.

The Benefits of Cochlear Implants (CI) for the Educational Progress and Placement of Deaf Pupils at Primary School in Riyadh, Saudi Arabia

Volume 2/2

Mohammed Albanyan

PhD

University of York

Education

December 2015

Table of Contents

Volume 2/2

List of Tables

Chapter 6: Discussion, Implications and Recommendations

6.1 Introduction

An interpretation of the key findings of this study will be presented in this chapter. The chapter starts with an overview of the rationale and aims of the research. The findings elicited by the research questions will then be discussed in relation to the relevant literature. The strengths and limitations of the project are provided. This chapter also examines the contribution of the current research study to theoretical knowledge and the potential implications of the findings for policy, practice and methodology for researching CI in SA. Directions and recommendations for future research are also provided.

6.2 Making the Parental Decision-making Process Regarding CI Surgery

In this section, the process of deciding whether or not to pursue CI surgery by parents of deaf pupils with/without CI will be discussed. First, the parents of pupils with CI and their decision-making process and expectations of CI outcomes will be presented. Second, perceptions of parents of deaf pupils without CI regarding CI intervention and their reasons behind the decision not to go ahead with CI surgery will be highlighted.

6.2.1 Expectations of Parents Who Permitted their Child to Have CI and their Decision Process

Information resources that were used by parents to get the decision of CI and whether they have been made aware of positive/negative outcomes of CI will be

discussed. Also, the level of parents' expectations of CI outcomes will be discussed. The hospital seems to dominate as resource of information regarding CI that is provided to parents (36/44, 81.8%) of deaf children in Riyadh-Saudi Arabia.

A notable majority of parents (47.7%) held high expectations regarding the benefits of CI treatment on their child's educational performance. There was also a moderate level of expectations felt by the parents (40.9%) involved in the study, while a low level of expectations was registered by 5% of these parents. This might give an indication that positive expectations of CI benefits could enhance parents' decision to have such an intervention for their child.

The majority of parents of deaf with CI were made aware of the potential benefits (25/44, 56.8%) and only (17/44, 38.6%) who made aware of possible negative outcomes. Hence, this might have enhanced the majority of them to have a high level of expectations. However, the awareness of potential benefits and of possible negative outcomes - were examined in order to explore issues that might affect parents' expectations. All the findings were statistically non-significant (Chapter 5). This could indicate that the expectations of CI outcomes for parents who decided to have CI for their children, might not be affected whether they aware of positive or negative. Parents might be desperate to help their children and be optimistic towards this treatment and look forwards to their child's development.

It seems that substantial level of parents' expectations is met by their child's outcomes in different aspects after having CI. The majority of the parents (88.6%) held a high-to- moderate level of expectations towards the outcomes of CI, and 93% of the parents agreed that CI had had a positive impact upon their child's educational progress. It was not just a high percentage of parents who agreed with such an

impact, but also both the teachers and clinicians. Improving hearing, abandoning sign language, language and speech improvement, developing social skills, easier communication, inclusive education and educational improvement were highlighted as advantages noticed by participants for pupils who had CI.

The parental decision might rely on the information that is provided by hospitals which delivers awareness of potential benefits and negative of CI outcomes. Also, majority of these parents have a high level of expectation that might have enhanced them to have such decision regardless the positive or negative information provided to them about CI. Moreover, it might be possible to conclude that high and moderate expectations might enhance the outcomes of CI. As the parents' high expectations were met by positive outcomes of CI made by pupils who had CI, it could also be argued that their decision might also be positive. Further discussion on the relationship and level of parents' expectations and educational performance will be later in this chapter.

6.2.2 Perceptions and Expectations of Parents Who Decided Not to Permit CI Surgery

Perceptions of parents of deaf pupils without CI regarding the CI and reasons behind not to have the decision of implantation will be highlighted. Also, the impact of these expectations and reasons upon the parental decision not to have the surgery for their child will be highlighted in this subsidiary.

It seems that there is a lack of awareness regarding CI and ways of obtaining such treatment. Parents of deaf pupils without CI were asked about their perception of the impact of the device. A high percentage of these parents (n = 29/57, 50.9%) stated that they had not had any information regarding CI, so they were not in a position to

consider CI for their children. One father stated: *"I do not have any background on this"*. However, 40% (n = 23/57) of these parents had positive expectations of CI outcomes such as improved hearing, speech, education, the ability to socialise and inclusion, while only 5.2% (n = 3/57) of these participants highlighted that a *"CI does not help deaf pupils"* and why (see Chapter 5, Table 58).

It can be seen that the majority of parents either had not been informed by hospitals, schools, rehabilitation centres or media regarding such treatment or they had a positive background of it but did not decide to have CI to their child. Also, there was only a small percentage of parents who did not expect positive outcomes of CI. Therefore, more investigations regarding the reasons behind not having CI for their children were conducted. Parents were asked to choose as many reasons as were applicable from a list (see Chapter 5, Table 79). The highest percentage for reasons given by parents of deaf pupils for not having CI were lack of information and awareness (n = 33/57, 57.9%), the risks to health (complications) reason registered 50.9%, while 49.1% selected low expectation of outcomes. The lowest percentage was given to the high cost (12.3%), which might be because the surgery is fully funded by the government. However, families have to pay for rehabilitation programmes and the maintenance of the device or materials, which are considered expensive.

In view of the findings cited above, the main explanation for deaf pupils not having CI appears to be the lack of information and advice provided to parents. This lack of awareness might also result in misunderstanding so parents might expect that there are risks to health (complications) and to have a low expectation of outcomes. For instance, father said *''because of the pain and deprives child of fun of childhood such*

as swimming and playing with kids''. Whereas in fact, CI might not prevent child to do such activates (Archbold & O'Donoghue, 2009). However, there are parents of deaf pupils in this study mentioned that CI cause a headache and prevent their children from doing some activities although there are a limited number of parents (2/44,4.5%).

Therefore, raising awareness might be a significant factor that could shape parents expectations and hence their decision in the appropriate time. Post-surgical outcome expectations of parents can be affected by their education about CI prior to the surgery (Alkhamra, 2015).

It is crucial to point out that parents should be made aware of such treatment in the right time of their children age otherwise would not be suitable and thus will miss the opportunity to help the deaf child. Parent said *''It was not available at birth of our child and then when he is seven years old we tried to do surgery but we have been told by hospital it is not suitable for his age''.* Moreover, such lack of awareness might be as a result of lack of rehabilitation centres and specialists. This lack of rehabilitation centres and specialists reported by the participants who involved in this study that is not respect to Riyadh city but also to all different regions in Saudi.

Asking parents to complete this research questionnaire seems to raise their awareness regarding CI as a possible treatment for their children. One parent said *''I wish that such intervention is more common and governments and charity associations adopted special needs''.* Therefore, an obligation should be paid by different associations in the community to help families and provide all necessary information of CI considering the effective time, way and content of such information. Furthermore, policy makers can develop better understanding of parents' needs and

expectations that are presented in this study and hence provide effective and appropriate services for deaf pupils and their families in terms of pre and post implantation.

6.3 The Benefits of CI upon the Educational Progress of Deaf Pupils at Primary Schools in SA

In this section, discussion will be presented regarding of the benefit of CI upon the educational progress of pupils who receive surgery and the advantages and disadvantages of CI from the perspective and experiences of parents, teachers and clinicians. The differences between the academic attainments of deaf pupils with/without CIs will be highlighted. Factors that might affect the outcomes of CI will then be discussed.

Pupils with CI at primary school, involved in this study, their age mean is (9.5) years old and age mean of implantation is (4.5) years old. Also, the deafness onset was from birth with no additional disabilities. However, other variables will be taken into account in the upcoming suction.

6.3.1 Post-CI Surgery Experiences of Parents, Teachers and Clinicians Regarding the Benefit of CI upon the Educational Progress of Deaf Pupils with CI

First, participants' experiences regarding whether CI have an impact upon their child's/pupils'/patients' educational progress will be discussed. Second, themes emerging from the data mentioned by parents, teachers and clinicians will be discussed in light of the implications of the themes (such as advantages and disadvantages) for educational progress.

As reported with previous chapter, a high percentage of the participants (parents, teachers and clinicians, n = 84/119, 70.5%) agreed that CI have an impact upon the educational progress of deaf pupils. A substantial difference before and after surgery for better in improved hearing, educational achievement, language and speech, psychological and social aspects, more inclusive education and greater independence were stated by parents, teachers and clinicians as advantages gained by their children/pupils/patients using CI. Stacey et al. (2006) argue that academic achievement and speech and language skills might be enhanced by CI. Nevertheless, variations could be occurred amongst pupils with CI (Boons et al., 2012a, Geers et al., 2009). Such variations reflected by participants involved in this study.

It is also worth pointing out that in the current study, there is a clear majority of both parents (n = 41/44, 93%) and clinicians (n = 9/10, 90%) who agreed on this matter, whereas there was a some notable variation in teachers' responses. Respect to parents and clinicians' perceptions towards the outcomes of CI might emphasis on the auditory and communication aspects. Huttunen et al. (2009) claimed that parents' perceptions towards the progress of their child in the areas of communication and education are compatible with enhanced auditory performance as a result of having CI. Whereas teachers might provide their experience from not just the auditory and communications perspectives but also from the educational, cognitive and social points of views. Only 32% of the teachers who took part in this study either disagreed or agreed to some extent that such treatment had an impact upon the educational progress of their students. Beadle et al. (2005) argue that although CI might provide long-term communication benefits to deaf children but such benefit might not reach a high level in schools subjects.

It was reported by the participants that there was an array of advantages to having CI that could help deaf pupils' educational progress. These advantages were identified by 50% or more of the respondents (parents, teachers and clinicians), and will be discussed further in the subsequent section.

The Advantages of Cochlear Implants for Deaf Pupils

In this subsidiarity, the advantages of CI for deaf pupils will be discussed. As mentioned earlier in this chapter, improved hearing, educational achievement, language and speech, psychological and social aspects, more inclusive education and independence were stated by parents, teachers and clinicians as advantages gained by their children/pupils/patients using CI. Considerable improvements in auditory perception and speech and language development can be gained by children with CI (Kim et al., 2010; Vlahović & Šindija, 2004). Moreover, educational, communication and social skills could be enhanced by such hearing management.

The theme of independence was mentioned by parents, and confidence was stated by teachers. This variation might be a result of the nature of each theme: parents might evaluate the independence of their child as he or she becomes better able to deal with everyday life, such as safety in traffic and using a telephone (Huttunen et al., 2009), while teachers mentioned the confidence which might accrue in the classroom while pursuing learning and dealing with teachers and peers. The clinicians also claimed that CI is a helpful substitute for children who do not gain any benefit from hearing aids (Archbold, 2009). This is emphasised by other research findings, as candidates for CI are severely-to-profoundly deaf at 70 dB and above (Lynne et al, 2010).

i. Improving Hearing

In the current study, the accounts given by parents, teachers and clinicians of their experiences and perceptions allowed a triangulation approach to highlight that pupils' hearing improves substantially as a result of having CI. Many studies found a clear functional improvement in hearing as a result of having CI (Murphy et al., 2011; Mederake et al., 2010; Richter et al., 2002).

Parents recounted the ability to hear and recognise voices as advantages that had been gained by their children. These advantages have important implications for making the learning process easier for pupils with CI as a result of being able to understand instructions and realising and identifying academic activities in the classroom and at home. For instance, one father of a pupil with CI commented that *"It is easy to teach and deliver him the idea of a lesson"* (Chapter 5). However, although educational progress for these pupils can be developed as a result of improved hearing, this is not to any significant degree, as such treatment does not restore full hearing (Archbold & O'Donoghue, 2009a); these pupils still have a level of hearing impairment which might have implications upon the educational progress. Further data regarding the educational level of pupils with CI in this study will be discussed in the next section.

Teachers referred to the advantage of improved hearing in light of their pupils' perception and better academic performance, which had increased since CI and were clearly noticeable to staff in the school. One teacher explained that *"pupils interact in doing tasks effectively through hearing their peers in the classroom"* (Chapter 5). Clinicians also stated that it was noticed that a significant audibility that enhanced deaf pupils' language which is the primary advantage of a cochlear implantation.

Geers (2006) states that maximising the chances of developing spoken language by providing speech information to the deaf child' auditory system and brain is the primary goal of paediatric cochlear implantation.

Therefore, the ability to learn more easily, understanding instructions, realise and identifying academic activities, improved perception and better performance, and improving language could be considered results of improved hearing gained by CI. Educational improvement, which was one of the advantages highlighted by participants, will be discussed in following section.

ii. Educational Improvement

Parents and teachers stated that improved education can be seen in pupils with CI. The desire to learn, being more conscientious and paying greater attention, improved learning skills and cognitive levels were reported by parents and teachers of pupils with CI. These developments are consequences of having CI surgery. One teacher claims that *'enhancing the desire for learning and educational level could be gained by deaf pupils who have CI'.* In similar vein, a father said '*CI can improve learning skills'*.

Abandoning or reducing the need for sign language helped hearing parents to teach their children who have CI (Chapter 5). However, participants mentioned that there were some pupils with CI who had acquired poor educational levels but this poor performance was attributed to the teachers to certain factors, such as a lack of rehabilitation and the relatively late age at implantation. Research suggests that learning and reading skills development are significantly affected by early detection and age of implantation factors (Archbold et al., 2008; Chadha et al., 2009). Thus, it

seems that poor performance might be a consequence of several contributory these factors, rather than the CI itself.

Respect to clinicians experiences, it is emphasised that academic attainment and mainstreaming classroom can be achieved by pupils with CI. This perception is concordant with De Raeve's (2011) argument that children with CIs can acquire aces to mainstream school in significant proportion. Fitzpatrick and Olds (2015) claim that the number of profoundly deaf children educated in classrooms alongside peers with normal hearing has been increased by the availability of cochlear implants.

Clinicians argued that significant outcomes will be gained if the CI is received before the age of five. For instance, the influence of cochlear implantation on the development of reading skills in deaf children could be enhanced by early age of implantation and improved technology (Geers and Brenner, 2003, Stacey, Fortnum, Barton and Summerfield, 2006, Archbold et al., 2008). Therefore, the advantages of having CI could be increased if certain factors were implemented such as early identification of deafness and early implantation. Further discussion regarding these factors will be presented later in this chapter. Improved language and speech will be the next advantage of CI mentioned by parents, teachers and clinicians.

iii. Improving Language and Speech

As reported in Results chapter, pupils with CI are able to show improved communication, formulate appropriate words, abandon sign language and show enthusiasm with regard to talking. These developments were mentioned by parents in light of their experiences. Richter (2002) argues that speech development one of important criterion of children with CIs. One father stated that *"There is an improvement in communication with my child because before implantation it was*

difficult to deal with him". Another reported about his son: *"B has conversations even if they are short… I can say that his speech is improving"* (Chapter 5). Nevertheless, more than 50% of the parents interviewed were not satisfied with the level of their child's speech intelligibility following CI. These participants also stated that their children faced difficulty in learning all the school subjects as a result of catching up after CI. One parent argued, however, that *"although it is difficult for my child to learn all the school subjects, at least he can learn some of them"* (Chapter 5).

The teachers also agreed with the parents in terms of the ability to respond easily and the greater degree of communication acquired by pupils with CI following their treatment. Moreover, receptive and expressive languages of these pupils were stated by teachers as aspects that are enhanced. Cleary et al., (2005) claim that receptive and expressive language could be improved by CI in comparison with other hearing impaired children who use different hearing aids. Both teachers and clinicians commented that enriched vocabulary and speech intelligibility could be gained by pupils who had CI. However, there was variation in the parents' and teachers' perceptions regarding the speech intelligibility of the children that can be achieved.

Over half of teachers who were surveyed claimed that pupils with CI could gain speech intelligibility with appropriate rehabilitation, whereas the parents were not satisfied with the level of intelligibility of their children's speech. In order to improve the speech, sounds recognition skills should be enhanced by conducting rehabilitation programmes (Holliday& Bishop, 2005). Furthermore, these skills might need an oral communication approach to be used rather than sign language. In this study, 34% of pupils with CI use oral approach while 15.9% relay on sign

language. The majority of these pupils (50%) practice total commination approach which is using both oral and sign language. However, Connor et al., (2000) found that regardless the communication approach that is implemented at school, expressive and receptive vocabulary over time has been demonstrated by children who use CI.

Naqawa (2010) conducted study in the effectiveness of oral/aural rehabilitation programme in enhancing speech skills for pre-schooler children with CI. This study found '*There were statistically significant differences at (=0.05) between the average post-test degrees of the experimental and control groups on the test of syllable and word repetition in favour of the experimental group'* (Naqawa, 2010 p: F). Also, it is worth pointing out that in this study, non-statically significant differences were found that can be attributed to the age of implantation.

The following section, attention will be turned to the positive psychological and social aspects.

iv. Psychological and Social Aspects

Increased social skills and more positive attitudes of pupils with CI were reported by more than 50% of the participants. These advantages had influenced these pupils' educational progress as one parent stated: *"My child is psychologically better"* and *"I noticed that my child has a better attitude and has been reflecting effectively upon his performance"* (Chapter 5). Moreover, creating a new life for a pupil and encouraging him to practise activities both inside and outside school might be considered a positive impact upon the social dimension i.e more motivated, more self-confident, higher academic and self-perception. Yael et al., (2011) claim that positive outcomes of CI are in the area of socialisation.

With respect to the side-effects of CI, it was claimed by the parents (27/44, 60%) that such treatment does not have negative side-effects or any discomfort for the child that might affect a pupil's mood or well-being. For instance, one father stated that *"It does not cause any inconvenience for the child or headaches like normal hearing aids"* (Chapter 5).

Independence

Independence, which was mentioned only by the parents, was considered to be an additional outcome of CI intervention. One parent claimed that there was a change for the better when comparing their child before and after surgery. The change was described as '*a big difference'*. Such independence for pupil with CI might help him/her to be individual who live with his/her peers as an equal in society without constraint or external control. For instance, one father stated that '*there has been a significant impact upon my child and our family, as he is now able to hear people around him and for example the sound of cars, the telephone and door bells … It has had a big impact on my child's life'* (Chapter 5). Huttunen et al 2009 argue that the lives of recipients and their families might be influenced by CI in a range of ways. Hence, deaf child with CI can be independent in the daily life without an external control.

v. Inclusive Education

Inclusive education is considered in many parts of the world to be the desired educational community, as it represents equality of opportunity and the right of any child to be educated inclusively. Ainscow & Cesar (2006) state that removing social exclusion that is a result of attitudes to variety in race, social class, ethnicity, religion, gender and ability is the aspiration of inclusive education. Also, this

inclusive education is promoted on the bases which indicates that including children in mainstream education is a right for them (Ainscow, 2005, Ainscow et al., 2006, Lindsay, 2007).Such mainstream education setting could also be a factor that might enhance educational progress (Marloes et al., 2014).

As reported in the Results chapter (chapter 5), parents, teachers and clinicians commented that, as a result of improved hearing, their child'/pupil'/patient' language, independence and social skills are enhanced by having CI, and deaf pupils can be included in mainstream classrooms. The number of profoundly deaf pupils educated in classrooms alongside peers without hearing impairment has been increased as a result of the availability of cochlear implants (Fitzpatrick & Olds, 2015). Moreover, Alkhamra (2015) found that 92% of sixty parents, involved in a study in Jordan, were expecting that their children with CI would receive education at mainstream school. Such inclusion would allow these pupils to benefit from their hearing peers in a way that could develop performance (Chapter 5).

Certain requirements or factors were mentioned by participants as conditions which enhance inclusive education for pupils with CI. These factors are either related to CI or to the school community. The former factors include the early identification of deafness, early implantation (the age of the child) and effective rehabilitation, while the latter include professional teachers and an effective educational environment. One parent stated that *"CI is very helpful but it needs professional teachers and an affordable rehabilitation programme to deaf children"*. One teacher pointed out that "*CI is suitable if the child has it at less than five years old and it depends on the effort that is provided for the child"*. All clinicians involved in this study (10/10,100%) supported this claim and one commented that *''it is a positive*

intervention if it is done at an early age'' (Chapter 5). However, regarding post-rehabilitation, some families stated that they had no idea how to deal with a child who has CI and they believed that the responsibility was solely with the school, so they neglected their child. Further discussion of the factors (environment, context and support) that might affect inclusive education for deaf pupils with CI will be presented later in this chapter.

In summary and in view of findings, the perceived advantages and benefits of having CI for deaf pupils are improved hearing, educational achievement, improved language and speech, positive psychological and social aspects, more inclusive education and independence. These benefits are identified by parents, teachers and clinicians that can lead to enhance the educational progress of deaf pupils with CI. However, the next section, some of the disadvantages reported relating to CI will be presented.

The Disadvantages of Cochlear Implants for Deaf Pupils

Perceived disadvantages of CI were reported by parents, teachers and clinicians, such as the negative impact and risk of surgery, the high cost, rehabilitation programme-related issues and delays in language and academic attainment. The appearance of the device and its negative implications for the pupil were mentioned by the parents (4/44, 9%) and teachers (9/65, 14%) but not by the clinicians.

The parents (n=6/44, 13.6%) reflected upon their experiences and perceptions regarding the disadvantages of CI from the viewpoint of family life. The great deal of effort required for both parent and child to cope with the surgical procedure and abandoning some activities such as sports were highlighted as disadvantages. 16% of parents involved in this study also reported a constant concern about their child's

health. Despite 38, 6% (17/44) of parents of deaf pupils with CI in this study, having been made aware before the surgery of negative outcomes, a high percentage (39/44, 88.6%) of these parents' expectations were also very positive in terms of CI outcomes. Discussion regarding the decision-making process surrounding CI treatment is presented earlier in this chapter (section 6.2).

A concern regarding the consequences of surgery was articulated by the teachers. 23% of these teachers (n =15/65) were of the opinion that the residual hearing of some pupils with CI might be negatively affected if surgery was unsuccessful. Nevertheless, the hospital that performs this surgery might have an influence upon the outcomes of CI, as one teacher claimed from his experience: *"I noticed that some of the students feel very comfortable about CI whereas others do not. Thus, as these students had the surgery at different hospitals, I would recommend investigating the differences between hospitals which might cause this difference"* (Chapter 5). Thus, differences between hospitals performance might be referred to the facilities and professionals between these hospitals. The clinicians indicated that the related health impact might represent a difference between hospital outcomes. One clinician claimed that *"there might be an impact from the surgery on the seventh nerve, with its implications upon facial muscles,* [the seventh of the 12 cranial nerves (Sanders, 2010)] *but these incidents in our hospital are few".*

Sounds reverberation, which can be present in the classroom, was highlighted by teachers as something that can be problem for pupils with CI. However, this reverberation could be the result of inappropriate classroom facilities, such as it might be tile not carpet. Hence, such disadvantage might be not directly related to

using a CI but to environment support. Further obstacles that might hinder the benefits of CI will be discussed in this chapter.

The high cost of surgery and device-related requirements such as maintenance and replacements materials were referred to by parents (15/44, 34%), teachers (7/65, 10.7%) and clinicians (2/10, 20%) as disadvantages. However, in SA, this type of surgery is fully funded by the government for citizens and for non-citizens in some cases. However, maintenance and replacement materials are expensive, as these issues are not covered by government grants. Therefore, although CI are considered expensive and not affordable for both some cases in Saudi and for deaf children in other countries, the high cost mentioned is not related to the cost of the surgery itself but to the consequences of this treatment.

The cost of rehabilitation programmes was also seen by 47% of the parents (n=21/44) as a disadvantage, whereas the teachers and clinicians highlighted the benefits of these programmes. With respect to 24% (n=16/65) of the teachers and 20% (n=2/10) of the clinicians, the argument seemed to be that it might be a challenge for parents and their children to commit with a comprehensive rehabilitation plan as a requirement for the success of CI. This plan demands a substantial effort from both the parents and the child. Thus, the clinicians stated that the degree of commitment to becoming involved in post-rehabilitation programmes would affect the outcomes of CIs. This challenge, however, should not deter parents and children from obtaining critical interventions such as CIs. Support for the family, raising awareness and professional services are provided to the parents and their child so that they might overcome such disadvantages.

The delay in language and academic underachievement was argued by the participants to be another potentially adverse outcome of CI. However, the percentage of the participants who highlighted this outcome was low. Some of the parents (6.8%), teachers (12.3%) and clinicians (10%) mentioned that there might be a delay in language and academic underachievement. This delay also occurs because CI outcomes need time to be identified. For instance in China, Wu, Liu, Liao, Chen, Chang and Lin (2013) found in study involved Mandarin-speaking children who receive CI that it appears that after 5–11 years of use the CI by deaf pupils, academic achievement to fall within the average range of their peers who are without hearing impairment and in the matching age. Also, one father stated that *"CI need patience and parents should not expect immediate results after the implantation"*. One of the clinicians highlighted a potential reason for the lack of clarity of speech: *"it might be a lack of clarity of speech, especially if it is a unilateral implantation"* (Chapter 5).

Regarding the appearance of the device, it seems that this issue might have a negative impact upon a child's daily school life. Sarcasm or curiosity from the pupil's peers that is caused by the appearance of the device was mentioned by parents (10%) and teachers (9%). Although the percentage of parents and teachers who raised this issue as a disadvantage was relatively low, the manufacturing companies seemed to have taken the shape and appearance of the device into consideration. However, since the CI was introduced in 1984, changes in CI technology have continued to improve (Moller, 2006). It is important to point out that those pupils who encounter such harassment might be unable to change their devices to a newer version because of the high cost involved.

Interviews

Interviews were conducted to explore the experiences and perceptions of parents and teachers of pupils with CI regarding the benefit of this treatment upon the educational progress of children receive it. The questions in the questionnaire were intended to explore individual experiences regarding CI as a medical intervention for deaf pupils, whereas the interviews were aimed at exploring this experience in greater depth. Moreover, it was felt that the nature of interviews as a tool for collecting data might allow both the participants and the researcher to explore aspects that could not be addressed within the questionnaire. For instance, parents and teachers as stakeholders might not be able to provide sensitive kinds of data, through the questionnaire, that were related to the school as this questionnaire data were collected from schools.

Regarding the positive benefit upon the educational progress of pupils with a CI, it is interpreting to note that 70% of both parents and teachers have similar percentages. The outcomes of CI upon the pupils' educational progress suggest, according to the parents, an improvement in language and speech intelligibility, improved reading comprehension and social communication compared with the situation before the surgery or with those of deaf pupils without CI. The teachers also highlighted a positive difference, in these aspects, in favour of pupils with CI compared to those deaf pupils who had not received this treatment. However, these teachers stated that pupils' with CI educational progress could be affected by kinds of the educational approach (curriculum and communication approach) and the type of educational placement.

Despite the positive benefit mentioned by parents and teachers, regarding CI upon the educational progress of pupils who have CI, the level of a pupil's education not being as desired. However, according to the parents, educational development could still be gained by these children. Geers (2006) claims that a significant variability in performance of pupils with CI is noticed and reasons for good and poor outcomes are limited explained. Nevertheless, in this study, all the parents interviewed (n=10) highlighted that there were reasons for this not high educational level, such as a lack of professional teachers, the type of educational placement, and the provision of pre-school educational services. Further discussion of these obstacles will be given later in this chapter.

It is crucial to point out that the parents and teachers of pupils who studied at a deaf school or a deaf unit, presented a negative perception regarding the outcomes of CI. They stated that although there is an improvement in their children/pupils hearing, these children show poor educational progress as a result of poor language and speech ineligibility. Because these pupils used sign language at this type of educational setting (deaf unit/school) and thus their speech intelligibility was poor. Therefore, this negative point of view might be a result of the type of educational setting, as pupils with CI did not move to mainstream or at least hearing-impaired classrooms. One teacher stated, "*These pupils confuse between using sign language and verbal language; I believe that educational progress depends on the pupil's language and thus the surrounding environment should enhance this language"* (Chapter 5).

Teachers emphasised the difference in positive educational progress between deaf pupils with and without CI. This difference might have been gained as a result of

development in the acquisition and modification of knowledge and skills, as well as the ability to use the oral-audio approach rather than sign language (Chapter 5). Furthermore, such development and ability could enhance the likelihood of obtaining a desirable education setting, such as a mainstream classroom or hearing-impaired classroom in a mainstream school. More discussion regarding inclusive education will be presented later in this chapter.

The teachers blamed the lack of parents' awareness of the process of the education of pupils with CI as an obstacle that might reduce the benefit of CI. For example, some parents believed that the school was totally responsible for a child's education and thus they were not involved in any form of teamwork with the school. One teacher remarked, *"Unfortunately, I believe that there is a lack of parental awareness which should exist before their child undergoes surgery"* (Chapter 5). This raises an urgent need for training courses that should be provided to parents. As mentioned earlier, further discussion regarding the obstacles that might affect the success of CI will be presented later in this chapter.

6.3.2 Differences between Deaf Pupils with and without Cochlear Implants in their Educational Progress

The comparison of educational performance between deaf pupils with and without CI in their attainment in different subjects was made in order to identify whether there were differences can be directly attributed to CI. These subjects were Mathematics, Reading and Writing, Religious education, Science, Social education, Art and Physical Education (PE). A matching was made amongst pupils involved in this study between deaf pupils with/without CI who are 10-11 years old and in year five at primary school.

The differences between deaf pupils with and without CI in their attainment (pupils who have mastered all skills) in the subjects of mathematics and reading and writing and science were shown to be in favour of pupils who had CI. Whereas other subjects such as religious education, Art and PE, the attainment of pupils with CI was lower than for pupils without CI. Moreover, it is worth pointing out that there are no differences between both groups in their mean school results in Social education. However, Chi-squared analysis was undertaken to examine whether there was a statistically significant difference in performance in the various subjects between the two groups. All findings were statistically non-significant at the 0.05 level in all subjects.

However, there were aspects that might influence, either individually or collectively, the educational outcomes of the pupils. One of these aspects was the nature of the evaluation system that is followed in primary school subjects, although there are lists of skills for each subject should be considered in this evaluation, it relies on the teacher's evaluation rather than a specific assessment scheme. The range of this assessment is also substantially broader because of the difference between a pupil who obtains mark 1 and masters all the required skills and a pupil who is given mark 2 and masters 66% and more of the skills. Thus, if a pupil achieves 99% of the required skills and another student masters 66% of these skills, both of them would receive the same grade - 2.

It was mentioned by the teachers that some staff at the deaf school were empathetic to deaf pupils in terms of assessing them, especially in religious assessment. One teacher said *''pupils need to read and memorise some verses of the Qur'an and it might be very difficult for deaf pupils''*. Another teacher claimed that *"Teachers are*

being tolerant with students in deaf schools or deaf units in terms of marking their students' work" (chapter 5). Whereas, another teacher argues that with respect to assessing hearing impaired pupils or deaf with CI, they are considered as hearing pupil and hence teachers assume that these pupils are able to read and speak. Therefore, the evaluation system which is applied for deaf pupils should be reconsidered and more support might be provided to these pupils.

6.3.3 Factors Affecting the Educational Progress of Deaf Pupils with CIs

The focus of this section is on factors affecting the educational progress of deaf pupils with CIs. These factors will be investigated through two ways. First, by cross-tabulation, the relationship between the variables and educational performance of deaf pupils with CIs will be investigated in order to identify factors that could affect their educational progress. Variables such as the age of implantation, the father's and mother's hearing level, the number of deaf family members, early intervention, length of time using a CI (as some student take of a microphone and sound processor (external part of CI) in school) and communication approaches were taken into account in this study. Second, the experiences and perceptions of parents, teachers and clinicians regarding factors affect the benefits of CI will be discussed.

The means of assessing the academic attainment of deaf pupils with CIs in all school subjects will be discussed. Academic performance according to the percentages of pupils who have/have not mastered all the skills prescribed in the subject will then be highlighted. As mentioned in the Results chapter, according to the academic (school) reports, the level of the student in the subject is assigned marks from 1 to 4 (1:High-4:Low). The reader is reminded that this information was readily available from

annual school reports sent to the parents of primary school pupils throughout Riyadh. The educational performance for pupils with CI in this study was between mark 1 (the student had mastered all the skills prescribed in the course) and mark 2 (the student had mastered 66% of the prescribed skills or more, including the minimum required skills) (see Chapter 5, Figure 5). The mean of pupils with CI is above 1.5/4. This indicates that the range of pupils' performance is between mastering 66% and all skills required in these subjects.

According to the different attainment scales at primary school (see Chapter 5, Table 84), Maths and Reading and Writing showed 63.6% and 59.1% of pupils, respectively, who had mastered all skills (see Chapter 5, Table 85). Pupils with CI showed higher performance in PE and art, as these subjects had the highest percentage of pupils who had mastered all skills, with 86.4% and 81.8% of pupils, respectively. The highest percentage of pupils who had not mastered all the skills, including the minimum skills required, was in Religious Education, with 11.4% of pupils (see Chapter 5, Table 85).

Although the educational progress of pupils with CI was at a relatively average level when compared with non-CI peers, their attainment might be considered as satisfactory because the percentages of students with CI who had mastered all the skills prescribed in the course were high compared with other pupils' percentages in same group (pupils with CI) who are at lower attainment scales in the same subjects (see Chapter 5, Table 85).

The Relationship between the Variables and Educational Performance

Variables such as the age of cochlear implantation, the parental hearing level, the number of deaf family members, early intervention, length of time using a CI (as

some students remove the microphone and sound processor (external part of CI) in school) and communication approaches, were taken into account in this study. In order to identify whether there are relationships between these variables and educational attainment, cross-tabulation was used to examine pupils' educational performance in the subjects of Mathematics and Reading and Writing. As mentioned in Chapter 5 (Results), these subjects were selected for further analysis because they are considered to be key curriculum subjects as well as including a variety of skills related to reading, writing and speaking. Archbold et al. (2008) argue that a reduced knowledge of the spoken language that is represented in a written text is one of major problems that many deaf children have.

With respect to the age of cochlear implantation, investigation was undertaken in order to examine whether the current academic year for the CI students in this study was in accordance with the students' chronological age. Two stages regarding the age at which pupils had the surgery were examined. The first stage was pupils who had had CI surgery at the age of 4 or less and the second stage was those pupils who had had CI surgery at 5 years old or more.

Having a CI at the age of four or less could have a positive impact upon educational progress. In this study, 32% (n = 14/44) of the pupils with CI had had this treatment at the age of four or less, while 68% (n = 30/44) of deaf pupils with CI had had this intervention at five years old or more; 79% (n = 11/14) of the former pupils were in the age-appropriate class, compared with only 6.6% (n = 2/30) of those receiving a CI at age five or more. Moreover, 63% (n = 19/30) of pupils with CI who had had this intervention at five years old or more, were studying in the year below (two

years' difference or more), the one in which they were supposed to be for their chronological age.

Another notable variable is level of parents' expectation towards the benefit of CI treatment on their child's educational performance and to what extent such expectations would meet the educational progress and outcomes of CI. The higher percentage of parents (47.7%) held high level expectation towards the impact of CI treatment on their child's educational performance. Also, moderate level of expectations has (40.9%) of parents involved in the study. Whereas, the low level of expectation registered only (n=5, 11.4%) of these parents.

It seems that parents' expectations met their children educational progress and outcomes of having CI. As the majority of parents (88.6%) held high to moderate level of expectations towards outcomes of CI, there are 93% of parents' agree that CI has an impact upon their child educational progress. In fact, not just parents who agreed with a high percentage towards such impact but also both of teachers and clinicians. Improving hearing, abandoning sign language, language and speech improvement, improving social skills, easy communication, inclusive education and educational improvement are pointed out as advantages noticed by participants on pupils who have CI.

With respect to academic performance, the higher percentage of pupils who have mastered all skills in Maths and Reading and Writing were pupils whose parents' expectations held high level (chapter 5). However, the difference between pupils whose parents' expectations are high and those with moderate and low expectations and mastered all skills in these subjects might be not substantial as it is only (6%).

As a result, it might there is a possibility of concluding that high and moderate expectations might enhance the outcomes of CI. Also, as the parents' high expectations met positive outcomes of CI and educational progress made by pupils who have CIs, it could be argued that their decision might be positive as well.

Another notable variable is the hearing level of the children parents. It is crucial to point out that the number of participants (deaf pupils with CI) whose parents were profoundly deaf was low with 9.1% of fathers and 2.3% mothers. 'Most deaf children are born to hearing parents' (Nance, 2003 p: 109, Marschark ,1997). The results showed that the percentages of pupils who had achieved all the skills required in Mathematics and Reading and Writing were 65% (n = 26/40) and 60% (n = 24/40), respectively, for pupils whose father's and mother's hearing level was normal. These results are markedly higher than those of pupils who had not mastered the minimum required skills in these two subjects (Chapter 5). Respect to pupils whose mother's hearing level was profoundly deaf, there was just one pupil and has not mastered the minimum required skills in both Maths and Reading and Writing. Also, pupils whose father's hearing level was profoundly deaf, 25% (1/4) of these pupils has not mastered the minimum required skills in both Maths and Reading and Writing. Therefore, the level of parents' hearing might play a role in enhancing the educational performance of deaf pupils with CI.

It is not clear whether the existence of more than one deaf member in a family affects the deaf pupil with CI outcome. This variable does not have a negative impact upon educational performance and showed positive results in mathematics. In this subject, with regard to pupils whose family has more than one deaf member, the percentage of those pupils who achieved all the skills required in Mathematics was 77% (n =

17/22), whereas the percentage of other pupils who did not have another deaf member in the family was 50% (n = 11/22) (Chapter 5). In addition, the percentage of pupils who had not mastered all the required skills was 4.5% (n = 1/22) for the group with more than one deaf family member, while the percentage trebled, to 13.6% (n = 3/22), for students who were from families that had just one deaf member. With respect to writing and reading, there were no differences in the results for both groups in terms of the number of pupils who had mastered all the skills required and those who had not. However, as this study investigated factors that affect the educational progress from participants' experiences as well (data will be discussed later in this suction), there are a variation in parents, teachers and clinicians regarding this factor. For instance, one clinician mentioned that from his experience, presence more than one member might affect the outcomes of CI negatively. Hence, further investigation on this aspect should be conducted within future research.

With regard to the early intervention programmes, preventing or reducing negative developmental consequences could be enhanced by the initiation of appropriate early intervention services before the child is six months old (Chapman et al., 2011). There was also a variation in the educational performance of pupils with CI who had/had not attended such programmes. Regarding pupils who had not had an early intervention programme, the percentage of those pupils who had achieved all the skills required in reading and writing was only 46% (n=6/13), whereas the percentage of pupils who had been provided with an early intervention programme and achieved all the skills required in this subject was 64.5% (n=20/31). However, in mathematics, the percentages of pupils who had/had not received an early intervention programme and mastered all the skills required were relatively similar.

Thus, this variable might have more of an influence on learning ability in terms of reading and writing skills than for mathematics.

Using a microphone and sound processor in the school day concerned the length of time pupils spent using this external device during the school day to aid their hearing. There was a difference in educational achievement between pupils who used this device for the whole of the school day and those who used it for either part of the time or not at all. The percentages of pupils from the former group who had mastered all the skills in mathematics were 68.2% (n = 28/41) and 63.4% (n = 26/41) for reading and writing, whereas pupils who used the external device either part of the time or never had not mastered all the required skills in either mathematics or reading and writing. However, it is important to point out that there were only three pupils (6.8%) who used the sound processor either part of the time or never.

Parents of deaf pupils with CI indicated which type/mode of communication was used in school for communicating with the pupil. There were three types of communication approach used by the pupils in the study: sign language, oral communication and total communication. A high percentage of those pupils who used sign language had not achieved the minimum required skills in the two subjects, compared with the percentage of pupils who used the total communication approach and the percentage of pupils who used the oral- audio approach (Chapter 5).

Using the oral-audio approach had enhanced reading and writing performance more than the other two approaches. In the subject of reading and writing, the percentage of pupils with CIs who used the oral-audio approach and had mastered all the required skills was higher than that for the other two groups (deaf pupils with CIs who used either sign language or total communication). Thus, progress in reading

and writing might be developed if the oral-audio approach was used more than, for instance, sign language. It seems that using sign language in communicating with pupils who have CI might have a negative impact upon their educational progress in mathematics and reading and writing compared with the outcome of using the other two approaches. Wheeler et al. (2009) claimed that choosing the type of communication approach to be adopted has received substantial attention, rather than the choices that are made by parents before and after cochlear implantation.

Experiences and perceptions of parents, teachers and clinicians regarding the factors affect the benefit of CI

A triangulation approach was adopted in data collection in order to explore the factors that could affect the benefits of CI for deaf pupils at primary school in SA. Parents, teachers and clinicians were involved so that these benefits or outcomes would be identified in light of their impact upon educational progress. In the questionnaire, series of (16) items were set alongside a Likert scale. Theses 16 items included factors of age at implantation, early identification of deafness, rehabilitation programmes, family role and awareness, teamwork, the presence of more than one deaf member in a family, communication approach, and the length of time spent using a microphone and sound processor (external device) (see Chapter 5, Table 97). Factor analysis was undertaken to identify the link between different items to be as a group that might represent a uni-dimensional factor (Kyriacou, 2014). Five main dimensions were extracted from this analysis and the implications of the findings will be discussed. These dimensions are Kind of communication approaches and length of time spent using an external device in school, Administration of rehabilitation

programmes, Early intervention and the role of the family, teamwork approach, More than one deaf member of the family and the nature of the rehabilitation programme.

Moreover, the parents and teachers of pupils with CI were interviewed in order to investigate factors related to the school dimension that could affect the educational benefits of CI. Different themes emerged during the analysis interview data, which were related to professional staff and the quality of teaching, curriculum, school, technology, FM systems in the classroom and at home, and the role of universities and higher education.

First, the five dimensions that were extracted from the Likert scale through questionnaires will be discussed and second, the school dimension and themes which emerged during the analysis interview data will be highlighted.

Table 126: The first dimension: kind of communication approaches and length of time spent using an external device (part) of CI in school

Dimension	No.	Items
Kind of communication methods and length of time spent using an external part in school.	1	The length of time spent using a microphone and sound processor (external part) in school.
	2	The kind of communication approach and its impact upon the benefits of cochlear implants.

The length of time spent using a microphone and sound processor potentially valuable on the benefits of CI. A high percentage of all the participants agree that such factor could affect the benefits of CI for deaf pupils who having CI. The kind of communication approach, whether total communication, the use of sign language or the audio-oral method, might also affect the outcome of CI. Based on the factor

analysis, it seems that there is a link between the length of time spent using an external device in school and the kind of communication approach used. There was also a relatively high percentage of pupils with CI who used sign language in school and those who studied at deaf school, so this might cause them not to use a microphone and sound processor. This is also raise the issue of the impact of a deaf classroom upon the benefit of CIs (more discussion will presented on this matter later in this chapter).

Table 127: The second dimension: rehabilitation programmes

Dimension	No.	Items
Rehabilitation programmes	1	Availability of effective rehabilitation programmes in Riyadh.
	2	Availability of information related to the location and means of obtaining deaf rehabilitation services.
	3	Recognition of relevance of deaf rehabilitation and speech therapy services by students and their parents.
	4	Availability of parents' intervention training programmes.
	5	Regulations issued by authorities that are concerned with providing rehabilitation, education and teaching services to students with CI.

It seems that there was a substantial difference between participants regarding this dimension. A high percentage of disagreement and neutrality was registered by parents and teachers regarding the availability of beneficial post-rehabilitation programmes in Riyadh (see Chapter 5, Table 97). This disagreement was also highlighted by these participants throughout the interviews as obstacles that might be

one of the reasons behind the poor educational progress of pupils with CI. However, the clinicians took the opposite view, with a high percentage of agreement that efective post-rehabilitation programmes were available in Riyadh. If this is the case in Riyadh, it is important to point out that other cities, in the kingdom, which do not have as many facilities as the capital might have.

Although it was claimed by the parents and teachers that there was a lack of rehabilitation programmes that could provide support for significant number of children requiring CI surgeries in Riyadh, it seemed there was another reason for not having such important programmes. The parents and teachers seemed unsure whether the schools and rehabilitation centres provided students and their parents with all the information related to the location and means of obtaining deaf rehabilitation services. Although the majority of the clinicians disagreed with the views of the parents and teachers and agreed that schools and rehabilitation centres provided such information, 30% (3/10) of the clinicians were neutral on this matter (neither agree nor disagree).

It is important to note that the nature of deaf rehabilitation and speech therapy services was recognised by the students and their parents. The basic elements of such services and their characteristics, such as service place conditions, the length of the sessions and considering the pupil's health condition when providing the service, might help both the family and the child to accept the rehabilitation and so enhance the benefit of such services. In addition, recognising the benefits of these services might enhance parents' and their child's ability to evaluate the level of the quality of the service. 60% of the parents (n=39/65) and clinicians (n=6/10), agreed that the parents and their child had a clear idea of the nature of such services, whereas only

24.6% of the teachers agreed with this. The teachers' percentage highlights a weakness in schools having pupils with CI. This is because schools must provide parents and pupils with all the instructions and information needed for participating in rehabilitation programmes.

Major disagreement was registered by the parents (47.8%) and teachers (58.4%) with the idea that schools or rehabilitation centres offered training programmes to parents in order to orient them on how they could support their child psychologically, educationally and socially. Of the clinicians interviewed, 60% agreed on this issue but 40% were neutral.

However, the effectiveness of the regulations that could be used to organise and ensure all the required services ran effectively and successfully is questionable. A small percentage of parents, teachers and clinicians agreed that such regulations were effective in that they delivered the required services adequately. As a result, a lack of available rehabilitation programmes and the absence of clear instructions for obtaining them might exist. In addition, this ineffectiveness results in a lack of enabling pupils and their parents to understand the nature of these programmes. Also, an additional challenge will be as consequence of the absence of training programmes that would enable parents to support their child psychologically, educationally and socially.

Table 128: The third dimension: early intervention and the role of the family

Dimension	No.	Items
Early intervention and the role of the family.	1	Early identification of deafness.
	2	Early age at implantation.
	3	Providing rehabilitation programmes.
	4	Family role in developing the educational progress of pupils with CI.

A high proportion of agreement was given by the parents, teachers and clinicians regarding the positive impact of the early identification of deafness, an early age at implantation and the provision of rehabilitation programmes such as auditory and speech therapy upon the education of pupils with CIs. According to the experiences and perceptions of the parents, teachers and clinicians, a significant role in developing the educational progress of pupils with CIs could also be played by their family. Antia, Jones, Reed and Kreimeyer (2009) state that parental participation in school is substantially related to academic achievements. This participation includes early involving of parents in supporting their child and cooperation with his school.

Table 129: The fourth dimension: teamwork approach - management following treatment (CI)

Dimension	No.	Items
Teamwork approach.	1	Offering educational services to students via teamwork is a prerequisite for the success of students with CI.
	2	Involving students and their family in drawing up an Educational Plan that is offered to students at school and rehabilitation centres is a prerequisite for the success of students with CI.

A prerequisite for the success of students with CI is offering educational services to students via teamwork that offers different services and includes students and their family. Specialties such as classroom teacher, special education teacher, audiologist, speech therapist, social specialist and parents working in teams could provide a professional and comprehensive educational and rehabilitation service. Eisenberg (2015) argues that a team approach is considered a significant factor in enhancing positive outcomes of CI and even from the very inception of the CI. However, according to the majority of the parents and teachers who were interviewed, this comprehensive approach is not currently available. Involving parents might also be a significant move towards success for students with CI, as this would involve making them more proactive rather than being a passive part of their child's treatment. However, parents' involvement in child's treatment would mean they had a better understanding of the nature of deaf rehabilitation and speech therapy services.

Table 130: The fifth dimension: more than one deaf member of the family and the nature of the rehabilitation programme

Dimension	No.	Items
More than one deaf member of the family and the nature of the rehabilitation programme.	1	Role of the type and length of rehabilitation programme in enhancing CI outcomes.
	2	Impact of the more than one deaf individual in a family on the educational performance of students with CI.
	3	Disregarding sign language and relying on the audio-oral approach as a method of enhancing vocabulary and speech ability.

A significant percentage of the participants' responses (Parents, 100%, teachers 96.9%, clinicians, 90%) regarding the impact of the type and length of a

rehabilitation programme that supports educational services was registered. The type and length of such a programme a potentially play a role in the progress level of students with cochlear implants. Thus, the programmes that are currently provided should be revised and evaluated in terms of their effectiveness and whether they support educational outcomes. The impact of the presence of more than one deaf individual in a family might affect the educational performance of a student with a cochlear implant. More than 60% (n=27/44) of the parents and clinicians (n=7/10) agreed that a negative impact on the performance of students with CI might be a result of having more than one deaf member in the family, 38.5% of the teachers agreed and 40% of them were neutral on this matter. The percentage was lower for teachers may be because parents and clinicians have a more details regarding the family background and situation more than teachers as 40% of them were neutral on this matter. Thus, it is important for teachers to be aware of pupil's background and family circumstances in order to provide an appropriate educational support.

At the same time, there was a high percentage of agreement among these participants that sign language should be abandoned and that the audio-oral method might be the optimal method for gaining language and speech ability. Such method could enhance the pupil's receptive and expressive language and speech intelligibility. Cannor et al., (2000) claims that oral communication used by parents in communicating with their child who has a CI might enhance language outcomes. However, Boons et al. (2012) argue that despite the ability to develop good language skills demonstrated by children with CI, large variability in outcomes remains a significant concern.

Parents and pupils might use sign language if there is another deaf member in the family and this situation might affect the improvement of speech which is one of

important criteria to assess the outcomes of CI (Richter, 2002). Therefore, such situation might require a specific type and length of rehabilitation programmes for pupil with CI who have more than one deaf individual in the family so that additional provision is provided in order to support this pupil.

School dimension

In this subsection, as mentioned earlier, factors that are related to the school dimension were investigated by interviewing parents and teachers of pupils with CI. Professional staff and the quality of teaching, the curriculum, the school, technology, FM systems in the classroom and at home and the role of universities and higher education that could affect the benefit of CI educationally from the participants' experiences and perceptions will be discussed.

Professional Staff and the Quality of Teaching

It seems that professional staffs are the key issue among the school-related factors that affect the educational progress of pupils with CI in primary school in Riyadh. Fidelity, integrity, interest, ability, motivation and quality of teaching skills were pointed out by parents and teachers as urgent requirements for teaching pupils with CI. According to some parents and teachers involved in the interviews, it seemed that there was a low level of satisfaction quality of teaching at children's school: 40% (n=4) of the parents claimed there was a weakness in school teachers' performance, whereas 50% (n = 5) reported that there were variations in this performance. One parent stated that *"Professional teachers are needed urgently"* (Chapter 5). One teacher also claimed that *"There is a gap in teachers' ability to deal with pupils with CI. There is an urgent necessity for teacher training"* (Chapter 5). One father commented: *"I believe that the teacher has a significant impact upon pupils'*

education. From my experience, there are variations in teachers' performance among schools" (Chapter 5). This variation might refer to the teachers' qualifications and training, according to another parent.

The data that were collected in this study also indicated that 30.7% (n=20/65) of the teachers had not been given training courses in special education programmes. In addition, 16.9% (n=11/65) of the teachers were qualified in the general education field rather than in special educational needs. 73.9% (n=48/65) of the teachers in this study held a degree in special education. However, although having a specialist degree is important, there might be another aspect that could affect the level of the teaching quality. A teacher's personality and the skills required should be taken into account in terms of the characteristics of a teacher who takes on the responsibility of teaching these pupils. One father argued that *"The teacher has a role in delivering knowledge and enhancing the recognition of sounds and words and connecting them to their meanings and resources for pupils with CIs. This learning method needs the teacher to be patient, calm and inventive"* (Chapter 5).

Teaching proficiency could enable teachers to detect individual differences and variations among pupils that should be considered in the educational process. One of the teachers stated that *"providing individual plans and considering different needs among the pupils with CIs are significantly required"* (Chapter 5). Teamwork approach, as found in the quantitative data, is considered a key issue in the educational process that is provided for pupils with CI. The participants were asked about this issue and its availability for their children and pupils with CI. It was reported that *''there is a lack of specialist teams, which includes the different specialities needed to assist and support pupils with CI''* (Chapter 5). Therefore,

teamwork could not be offered at school as a result of a lack of specialists such as speech therapists and audiologists.

It seems that there is a significant lack of speech therapy professionals at either schools or rehabilitation centres, not just in Riyadh but also in the whole of the Kingdom. A father said *''there is a significant limitation in the number of speech therapists at both schools and hospitals''.* Also, teacher claims that *''The waiting list of rehabilitation's appointments at some hospitals take months''.* Moreover, links were made between the weakness of teaching and speech therapy skills that the teachers of pupils with CI should have. One teacher noted that '*unfortunately, the current evaluation of teachers is significantly negative because of lack of preparation and training and inadequacy in speech therapy skills'* (Chapter 5). Therefore, the urgent need for training courses and the importance of recruiting speech therapists in schools should be taken into account by the Ministry of Education in SA. The decision-makers at this ministry could help and enable this requirement to be implemented when the issue has been demonstrated to have an important impact upon the educational progress of pupils with CIs. Thus, in order to address the lack of professional teachers of pupils with CI in SA, it is believed that this is not a finance-related issue, but one that requires greater awareness and special training of staff.

Curriculum

Curricula help pupils in acquiring knowledge and skills. The majority of the parents and teachers interviewed argued that the current curricula were difficult for pupils with CI, because they had been designed for hearing pupils and individual differences might not be considered by teachers. Moreover, lack of flexibility in the

curricula and examinations and not managing lesson times properly were highlighted as obstacles. Also, currently, there are a great number of required curricula and pupils are becoming exhausted by demanding timetable. Therefore, a differentiated curriculum was requested by the parents and teachers of pupils with CI: an adapted curriculum that could enhance these pupils' learning, as 90% (n = 9) of the parents and 70% of the teachers (n = 7) sought an alternative.

The adapted curriculum that was demanded might mitigate and minimise certain parts of the content and focus on speech, vocabulary and inference (deduction) from images and on the other educational skills needed. Moreover, it might be an additional curriculum working alongside the main one to understand and realise words and their meanings, as well as to make connections between words and pictures, sounds and their sources.

From the teachers' perspective, such an additional curriculum might help in accelerating learning for pupils with CI so they can catch up with their peers. However, having an additional curriculum should be alongside the national one so that it enhances pupils' ability to prepare for future education (university). Because they would learn the typical national curriculum that prepares all students for university. The teachers provided another solution, which would include pupils with CI in a hearing-impaired classroom in the first phase and they could then be moved into a mainstream classroom. When the nature of the latter educational setting would be to have a limited number of students and a special teacher, which might allow the implementation of an adapted additional curriculum alongside with the national one.

From the participants' responses on the interviews, it can be seen that their concerns were regarding reading perception, catching up with hearing peers, and individual

differences. Therefore, attention should be paid by both the Ministry of Education and teachers to improving this aspect. However, based on the Ministry regulations (Ministry of Education, 2013), the curricula and skills required for each subject are designed and provided by the Ministry of Education. Thus, schools and teachers cannot change the material of these subjects. Nevertheless, substantial movements have been ongoing in terms of revising and improving the national curricula generally in SA. Therefore, this might be a critical time for such movements to take into consideration the stakeholders' experiences and perceptions presented in this study regarding the curriculum provided to pupils with CI.

A differ curriculum to the additional curriculum that is mentioned above has been discussed with parents and teachers. This differ curriculum is a special curriculum which is one type of curriculum provided for pupils with special needs who study at a special school. As pointed out by the participants: 70% (n = 7) of the parents and 70% (n = 7) of the teachers disagreed with providing pupils with CI with this type of curriculum. Those who disagreed with special curricula argued that such a curriculum might lead to exclusive education. One father stated, *"I am concerned that a special curriculum might lead to excluding them in special classrooms because the mainstream classroom provides the public curriculum"* (Chapter 5). Nevertheless, teachers (n=3/10) who felt that a special curriculum might be suitable for pupils with CI suggested that a special curriculum should be applied.

This suggestion was due to the absence of support and educational requirements that should be available currently in order to include these pupils within a mainstream classroom. Thus, it can be seen that the supporters of a special curriculum made this claim not because they opposed the standard curriculum, but because of a lack of the

conditions and support that are needed in order to apply such a curriculum. Therefore, they sought a special curriculum that might meet the ability of pupils with CI in light of significant challenges in a non-supported classroom.

It is crucial to highlight the difference between an adapted (differentiated) and a special curriculum from the parents' and teachers' perspectives. An adapted curriculum represents adaptations in the methods of delivery and in the assessment and evaluation methods, mitigating the required skills, and adding materials that are needed by pupils with CI. Special curricula, in contrast, are provided for pupils who are defined as having special educational needs and are significantly limited and different from the curricula provided in mainstream schools.

Audibility and speech intelligibility were highlighted by teachers as requirements for pupils with CI to be able to understand the curriculum and achieve the desired educational progress. The teachers highlighted that there are variations in these two significant requirements among CI recipients. Also, Boons et al. (2012) argue that large variability in outcomes remains a significant concern, despite the ability to develop good language skills demonstrated by children with CI. Thus, it is crucial to investigate in depth the reasons behind this variation.

In this study, according to parents and teachers interviewed, pupils with CI whose speech intelligibility and audibility were not at the average level might be the result of having received the implantation when they were older and a lack of post-rehabilitation. Moreover, it was mentioned by both parents and teachers that CI surgery performed in the period prior to five years ago might not have had satisfactory outcomes. Participants who claimed this situation existed stated that unsatisfactory outcomes might be a result of conditions applied to candidates that

might not have been appropriate. However, CI has now become a sophisticated procedure in terms of applying and accepting candidates. For instance, one teacher stated that CI has been performed at early age than five years before. Also, Moller (2006) states that there is a continues changing in CI technology since such treatment was provided in 1984.

Bilateral cochlear implantation might have more impact on educational progress than unilateral implantation, as pupils can identify sound directions (auditory localisation). McNeill (2012) states that developing binaural interaction and sound localisation as a result of electric auditory stimulation is possible currently. In this study, the data show that only 18.1% (n = 8) of the pupils with CI had a bilateral implantation. Therefore, both parents and clinicians should take bilateral rather than unilateral implantation into account as these are the majority of the current cases. Archbold & O'Donoghue (2009) state that a recommendation is made by professionals for deaf children as being clinically appropriate to have a simultaneous bilateral implantation, and sequential bilateral implantations for those who have already been unilaterally implanted. However, Ramsden et al. (2009) argue that not all deaf children are suitable, nor do all parents wish to proceed despite the optimal auditory outcome that can be gained by bilateral implantation.

Schools

In the interviews, both parents and teachers identified that there are certain roles that can be implemented by schools in order to enhance the educational progress of pupils with CI. The role related to school staff awareness of CI, the presence of specialist staff such as speech therapists, reducing the number of pupils in a classroom, developing school facilities and reducing the total number of pupils in a school could

enhance educational progress, according to the parents of these pupils. All the fathers (n = 10) highlighted such supportive educational aspects could create an appropriate and effective school and prepare classrooms for pupils with CI.

The majority of the teachers (n=10) interviewed indicated that implementing and organising educational, psychological and technical roles through a designated group of staff acting as a working group should be established in schools. This group could supervise pupils with CI and provide all the services needed by both teachers and pupils. An effective relationship between school and home should also be built, so that parents' role in supporting and educating their child can be enhanced. This relationship could also produce substantial collaboration in providing training courses for parents in respect to CI. For instance, learning about and dealing with pupils with CI, pre/post rehabilitation, as well as issues regarding the device (external part of CI) and how it can be protected. One teacher suggested that *"the school could help families in dealing with residual hearing and hearing that is enabled by CI"* (Chapter 5).

Technology: FM Systems in the Classroom and at Home

'FM Systems are wireless assistive hearing devices that enhance the use of hearing aid(s), cochlear implants and also assist people who are hard of hearing but who do not wear hearing aids, in particular over distance and in noisy environment' (Hearing Link , 2015). Learning and teaching aids and the benefits of technology such as FM systems should be made available as a matter of urgency, according to the parents and teachers of pupils with CI. Parents (n = 7/10) and teachers (10/10) argued that such technology would improve communication, making it easier and better and eliminating external influences from noise. For example, the air

conditioners that are located in every classroom due to the nature of the weather in SA can cause a high level of noise. Specific facilities such as sound insulation are required so that an FM system can be effective.

Not only are more conducive facilities required for pupils to gain benefits from the new technology, but there are other aspects that should be taken into consideration. For example, the ability of school staff to work and manage such devices is a significant issue that should be addressed. Related issues include: knowing how an FM system works, as well as microphones and sound processors and hearing aids; reading and keeping up to date with research on hearing impairment; changing batteries; checking whether a CI is working or not and assessing the level of hearing and referring pupils to a specialist centre if any help is needed, such as checking the programming of the CI. As these issues would significantly affect the outcomes of CIs, the Local Education Authority needs to ensure that staffs are able to deal with them confidently and competently.

Participants suggested two substantial solutions in order to ensure staff capability in effective management of the available technology: providing training courses to school staff and co-ordination between hospitals that perform CI surgery and schools. To illustrate a situation that could affect the benefits of CI in the classroom, in many cases school staff may not know whether a pupil's device was working properly. Moreover, as mentioned in light of the teamwork factor, the teaching approach when using this technology should be agreed by the family, teacher and speech therapist involved in the child's management.

Universities and the Higher Education sector could address the lack of professional staff such as teachers, speech therapist and audiologists and also collaborate in providing training courses that could be delivered to both parents and teachers. A speciality bespoke training programme could be developed and offered by universities to provide a specialised Diploma in the area of teaching pupils with CI. This would address the current lack of specialists in schools and centres and become a resource for training and support.

6.4 Benefits of CI in Determining the Educational Placements for Deaf Pupils in Primary Schools in SA

In this section, both the quantitative and qualitative data will be discussed in light of the benefit of CI upon the educational placements of deaf pupils in primary school in Riyadh. The current educational settings that pupils with CI have will be presented. Next, a discussion of the impact of CI on raising the ability of these pupils so that they can be included within mainstream classrooms will be highlighted in terms of parents' and teachers' experiences and perceptions. The role of environmental support that could reduce or promote inclusive education is also covered in accordance with the participants' responses.

6.4.1 Current Educational Placements of Deaf Pupils with CI

Hearing-impaired units attached within mainstream schools were the dominant educational settings for participants in this study (n = 28/44, 63.6%). It is crucial to highlight that no pupil in this study was registered to study in a mainstream classroom. However, there was a low percentage of students with CI (n = 5/44,

11.3%) who studied in an integrated setting, which are mainly located in special units and integrated with mainstream classrooms for part of the school day. Furthermore, 25% (n = 11/44, 25%) of the pupils with CI studied in a deaf classroom. This percentage might be considered high as pupils should either study in a mainstream classroom or at least in an integrated setting. De Raeve (2010) argues that pupils with CI go to mainstream schools in larger proportions and fewer to schools for the deaf. Also, Huber et al. (2008) state that integrating well into the hearing world concerning their schooling and postgraduate development were the findings of the majority of CI users.

The majority of the pupils with CI (n=39, 88.6%) studied either at hearing-impaired or deaf school/ units attached within mainstream schools. These types of educational setting are considered as exclusive education, even though they are attached to a mainstream school, because pupils in these settings have special classrooms, teachers and academic timetables. Pupils attending these units are only together with hearing pupils in the playground and for some non-academic activities, such as morning assembly. Nevertheless, these educational settings might be more acceptable than special schools, which are completely segregated.

In this study, 15 pupils (n=15/44, 34%) had CI while they were at school, seven of whom had moved to an education setting that was less exclusive as these pupils hearing improved following CI surgery. These (n=7/15) were moved from a special school to either a hearing-impaired or deaf classroom, with part of the day spent in a mainstream classroom in a public school. There were also pupils who had moved from a special school or a deaf unit to a hearing-impaired classroom, where most of the pupils communicate using the oral-audio approach rather than sign language.

With regard to pupils who had CI before school age, the majority had been referred to hearing-impaired units. However, as mentioned earlier, these movements might not be the desired outcome, as the majority of pupils with CI had not yet been included within mainstream classrooms. Therefore, despite having CI surgery, these pupils were educated either with pupils who had moderate-to-severe hearing impairment or were profoundly deaf rather than hearing peers. This situation might have a negative impact on the deaf pupils with CI auditory, language, psychological and educational development. In addition, pupils with CI who studied in deaf classrooms used sign language, as it is used as the primary communication approach in this educational setting (example). One teacher says

'Because in the deaf classroom the main communication tool is the sign language, these pupils are confused between using sign language and verbal language; I believe that educational progress depends on pupils' language and thus the surrounding environment should enhance this language'(see chapter 5).

However, according to the teachers' experiences and the record of the Ministry of Education, in reality inclusive education in Saudi Arabia is limited. Also, Elshabrawy (2010) argues that both inclusive education and integration concepts have been seen as extraordinarily problematic and complex in the Middle Eastern context. The majority of pupils with special needs in SA are educated in units attached to mainstream schools. As an illustration of this, there is no framework, experience or specific regulations for inclusive education in the Kingdom. Al Braheem (2003) reports that the most substantial social problem fronting head-teachers was that neither deaf nor hearing students were prepared for integration. Therefore, this might affect the type of educational setting that pupils with CI have access to. However, there has been substantial revision of these regulations, and there is currently a move towards inclusive schools in SA. Furthermore, having a CI

intervention during the school age might not encourage pupils' ability to be included within mainstream classrooms.

In summary, in this study, the majority of parents' and teachers' experiences and perceptions indicated that CI had had positive benefits in terms of improving hearing, speech intelligibility and educational progress. Also, the achievement of pupils with CI who mastered all skills required in subjects was also higher than those of deaf pupils without CI although all findings were statistically non-significant. However, the majority of these pupils are educated in either separate units attached to mainstream school or special school. Nevertheless, the CI intervention enhances the deaf child's auditory perception and speech intelligibility and thus enhance their educational achievement, so that those pupils who have CI can be educated in a desired inclusive education setting. Therefore, further explanation regarding the reasons behind situating these pupils in a deaf classroom will be discussed.

Reasons for referring pupils with CI to special school and deaf units in public schools have been investigated in this study in depth. The parents and teachers of pupils with CIs highlighted medical-related reasons that negatively affect outcomes of CIs, such as the lack of hearing. Also, speech rehabilitation and the late age of implantation and different obstacles to inclusive education were pointed out by participants.

It was claimed by the participants that it was possible for candidates either not to be medically eligible to have CI or a child's IQ might be below average. As mentioned in the Literature Review chapter, as requirements of having this treatment, candidates should meet medical criteria and their IQ level should not be below average in order to benefit from CI. As mentioned earlier in respect to the lack of rehabilitation

programmes and the negative impact this has upon educational progress, it seems that this factor again influences inclusive education. This negative impact results in a weakness in pupils' academic level and language ability so they cannot meet mainstream classroom requirements in terms of educational skills. Because rehabilitation programmes enhance the positive outcomes of CI that include the recognition of sounds and understanding their meanings or concepts, rather than simply hearing the sounds. The participants argued that the lack of such programmes might compromise the content of the training and lead to a low number of specialists either in schools or centres.

The shortage of professional teachers who could teach these pupils was highlighted by both parents and teachers during their interviews. This shortage was also mentioned in the previous section as one of the factors that might affect the educational progress of pupils with CI in primary schools in Riyadh. All participants who are interviewed (n=20) suggested that training courses were needed for teachers who would be responsible for teaching these students.

Collaboration should also exist between the school and the family so that an individual educational plan could be implemented in light of teamwork. Moreover, it was claimed by both parents and teachers that the pre-school stage can play a significant role in enhancing inclusive education. Recently in Riyadh (Riyadh Education, 2015) pupils with special needs have been allowed to be accepted at this educational stage (in some nurseries). However, it seems that there has been no evaluation of these pupils' nursery outcomes so far.

It is important to point out that social and economic changes in the community might make a difference in the outcomes of CI. Also, the educational level of the parents

could have a positive impact on their parents' awareness of implications of CI. Wieringen and Wouters (2015) state that a good spoken language is significantly predicted by parent involvement and this is related with higher socio-economic status. In this study, a high percentage of parents who did not decide to have CI to their children were only had a high school qualification (chapter five). Moreover, as a negative impact of these social and economic changes, children's language improvement might be affected by playing with electronic games and spending a long time with a childminder who is not usually an Arabic speaker.

It was claimed by the parents and teachers that surgery performed currently might have a more positive impact than it might have had five years ago, as this is now performed at an earlier age. Thus, it is expected that the number of deaf children with CI who are educated in a deaf classroom was higher five years ago than it is now. It is also crucial to point out that Ministry of National Guard agreed- Midical city in Riyadh established newborn screening in April 2010 (Ministry of National Guard agreed, 2015). In December 2014, this screening was officially by the government (Alriyadh, 2015). Therefore, as a result of increasing hearing screening and introducing the CI at early age, deaf children will gain advantages in many respects such as spoken language skills at a young age, however, other respects have not changed (Archbold & Wheeler, 2012, Wieringen & Wouters,2015).

It was crucial to take into account procedures regarding educational placement in this investigation. It was claimed by parents that there might be a kind of vagueness and difficulties in registering their children in mainstream classrooms. It is worth pointing out that families often face challenges in accessing diagnosing services, such as where and when such services could be conducted. One father claimed that,

“Unfortunately, there is no specific and known association. Such issues rely on parents who do not have sufficient knowledge to raise awareness of evaluation and diagnosing procedures and sources” (Chapter 5).

Teachers who work in the field and have had experience of such procedures commented regarding the process of referring pupils with special needs to an appropriate educational setting. It seems there was no obvious mechanism or guidance for parents. There are two admissions committees which take such decisions: the Special Education Centre (Local Education Authority) and the other is located in the school. Hence, the parents argued that sometimes there is contrary in the tests results and the refereeing decisions amongst these two committees. Therefore, the reported conflict in these significant procedures might affect the selection of an appropriate educational setting for pupils with CIs. According to the teachers, the first committee had a multidisciplinary team (doctor, psychological specialist, special education teacher, speech therapist, audiologist, social worker, parents and their child). This team was able to provide relevant assessments and take decisions regarding an appropriate educational setting for pupils.

Having explained the different points of view regarding the diagnosing and referral procedures, decisions regarding the type of educational setting will now be discussed. Regarding the pupils with CI who studied in deaf classrooms, a severe-to-profound deafness range and/or the inability to recognise the meaning of sounds and a lack of vocabulary would cause an evaluation committee to refer a pupil with CI to a deaf classroom. With respect to hearing-impaired units, a pupil with CI would be referred to this type of unit if the pupil had difficulties with language, even though his/her hearing level was classified as mild. Thus, these pupils will not be included

within mainstream classrooms because referring them to such a setting would require them to have a certain level of competence in language and intelligible speech.

It is important to point out that language improvement after CI needs months to several years to achieve the maximum results (MedlinePlus, 2015). Also, Liu et al. (2013) argue that with an early implantation the academic achievements can fall with the chronological age after 5–11 years of using CI. Therefore, for instance, if pupils with CI are referred to hearing impaired classroom, reassessments needs to be implemented after six to twelve months to decide whether this pupil can be moved to mainstream classroom or as part of school day. Also, it seems there is no a clear statement within the current Special Educational needs regulations stats that pupils with special needs can be moved from special needs units to mainstream classroom. One teacher said ‘‘if there is improvement in the educational and language level of deaf pupil that enable him to be moved to mainstream classroom, I cannot take such decision because it is not supported by Special Educational regulations’’. Also, one teacher reduced the likelihood of moving a pupil with CI to a mainstream classroom as a result of the lack of rehabilitation programmes (Chapter 5). However, another teacher stated that while a pupil studies in school, reassessment can be conducted and then a decision regarding the possibility of movement to inclusive education can be considered. Furthermore, there might not be a clear procedure for the process of reassessment, such as the period of time there should be between the first evaluation and the review one.

Afterward, moving a deaf pupil with CI from one setting to another depends on available source and individual circumstances. The responsibility for taking the decision regarding the reassessment should also be identified. Therefore, these issues

should be taken into account and discussed by a diagnosing committee that includes the parents and the child.

A late age of cochlear implantation was pointed out by parents and teacher of pupils with CI who study at deaf classroom, as a reason for making these pupils study in a deaf classroom. In this study, the average age of implantation was 4.5 years (Chapter 5). There were also pupils involved in this study, although not many, who had had CI at the age of seven or eight and even older. However, such delay in surgery might have been because of a late identifications of deafness, lack of cochlear implantation awareness on the part of the parents or due to waiting list for the surgery. Therefore, new-born screening which officially approved by Saudi government in December 2014 can enhance the early implantation. Archbold &O'Donoghue (2009) state that newborn screening that is conducted in developed countries has been enhanced the early identification of deafness and then the early intervention by cochlear implantation.

As mentioned, CI outcomes need time to achieve the maximum results. Geers et al. (2008) argue that a long-term positive impact on auditory and verbal development could be gained by early cochlear implantation. Therefore, having CI when the child is of school age might affect positive outcomes of CI and also difficulties in terms of making a decision to refer the child to a mainstream classroom as the child's language has not improved yet. Moreover, parents and teachers stated that there was a great confusion between using the oral-audio approach or relying on sign language, which is the approach used in deaf classroom setting.

As this section discuss the educational placement of deaf pupils with CI, the key issue to investigate is the extent to which CI do/not help these pupils to be included

within mainstream classrooms or there might be other reasons. The next sections will show the benefit of CI upon aspects such as independence, participation, student voice and academic ability that could enhance inclusive education. Then, the role of the e educational environment (school dimension) that might have an impact upon inclusive education will then be examined.

6.4.2 Perceptions and Experiences of Benefit of CI in Enhancing Inclusive Education for Deaf Pupils with CI

Enhancing inclusive education for pupils with CI will now be discussed in light of the impact of CI upon aspects that could enhance inclusion. These aspects are independence, participation, student voice and academic ability. These aspects are considered factors that could enhance inclusive education. Thus, the aim is to explore to what extent these aspects might be influenced by cochlear implants so that pupils with CI can be included in mainstream classrooms. The parents and teachers of deaf with CI were asked to provide their experiences and perceptions through questionnaire included a Likert scale set against 11 items representing such aspects.

According to the majority of the parents and teachers of deaf pupils, CI seems to help these pupils to be independent and participate and compete in educational, artistic and physical activities inside school (as reported in chapter 5). This consensus also applied to the ability of pupils with CIs to express their needs and feelings inside school to their teachers and peers. With respect to academic ability, the majority of the parents and teachers also agreed that with the help of CI, pupils could improve their educational achievement effectively. However, a variation in participants' responses was registered regarding the statement that, with the help of CIs, students could study in a mainstream classroom along with their hearing peers: 68.2% (n =

30) of the parents but only 35.4% (n = 23) of the teachers agreed on this matter, while 26.2% of the teachers and 13.6% of parents disagreed. There was also a relatively high percentage of teachers (38.5%) and parents (18.2%) who were neutral on this matter (Chapter 5).

Although 68.2% of the parents agreed with the possibility of their pupils with CIs being educated in mainstream classrooms, the result that only a small percentage of teachers agreed on this matter should be taken into account. This might be linked with the results of this study that show that the majority of pupils with CIs studied either in separate units or special schools. However, positive outcomes had been shown by these pupils in terms of independence, participation, student voice and academic ability, according to the parents and teachers of pupils with CIs. Therefore, as mentioned earlier, it was stated by parents and teachers that there were different reasons behind teaching pupils with CIs in special classrooms rather than in an inclusive setting.

It seems that not only factors such as medical reasons, lack of rehabilitation and late implantation could affect inclusive education for pupils with CI, but there are potentially other obstacles. These obstacles are related to the school dimension (the educational environment). Mainstream classrooms that are unprepared in terms of the nature of inclusive classrooms can be one of these obstacles. For instance, from the participants' perspective, a large number of students in a classroom might prevent pupils with CI from being included within mainstream classrooms. Likewise, the procedures for evaluation and making the decision to refer pupils with CI to the appropriate educational setting should be revised and improved. The next section discusses factors that could affect the inclusive education of pupils with CI.

6.4.3 Perceptions and Experiences Regarding Role of Environment that Could Affect Educational Placement for Deaf Pupils with CI

Schools which embrace pupils with special needs are essential for inclusive education. In the current study, parents and teachers were asked whether the pupil's current school embraced deaf pupils with CI: 55% (n = 11/20) of the participants (parents and teachers) disagreed with the statement that the school does embrace their child/pupils, which might result in hindering inclusive education. Only 20% (n = 4/20) of the participants agreed with this matter. Therefore, school's role in embracing inclusive education for deaf pupils should be taken into account by both the educational authority and the school staff. Spratt & Florian (2015) argue that preparing teachers to meet the challenges of teaching in diverse classrooms as a result of the substantial role that teachers play in influencing student achievement.

A school not embracing pupils with CI means that this school does not provide and adapt all the necessary requirements so that pupils with CI can be included in the classrooms. These requirements might be educational, psychological or physical. One parent claimed that in his experience *"Schools are not prepared and adapted to embrace pupils with CI in terms of facilities, equipment"*. Another father highlighted the negative attitude of school staff, stating that *"They do not know what CI is about, from the head teacher to the school guard!"* (Chapter 5).

The large class size of students in the classroom was a concern voiced by the teachers. One teacher reported that *"There is a significant number of pupils either in a hearing- impaired classroom (14 pupils) or a mainstream classroom (40-45 pupils)"* (Chapter 5). There also seems to be a lack of equipment, such as FM systems and sound insulation in schools. Although it was stated that some schools

have such facilities, the majority do not. As the Ministry of Education is able and willing to provide such facilities, it seems that the reason behind this shortage is not the issue of cost but a failure on the part of schools to identify the need for and demand these facilities. AlBraheem (2003) claims that the most substantial administrative problem experiencing head-teachers is poor quality of mainstream school buildings in which to integrate deaf and hearing impaired pupils. This situation was mentioned also by a teacher who works as a co-ordinator between the Ministry of Education and schools that have pupils with hearing impairments (Chapter 5).

Because of language weakness of current pupils with CI and also due to lake of school facilities, the majority of teachers, in this study, either natural or not preferred that deaf pupils with CI study at mainstream classroom. Therefore, it is a critical that a future research to investigate teachers altitudes towards the inclusive education. Alshahrani (2014) states that *''While some Saudi educators are in favour of integration/inclusion policies, others are against them and what they imply'' (p:16).* Moreover, the majority of teachers (n=48/65, 73.8%) involved in this study have experience in teaching more than 11 years so that some researches (Leroy and Simpson,1996, Koutrouba et al 2006) suggest that young teachers have more positive attitudes towards the inclusive education.

As stigmatising behaviour and bullying in the classroom or within the school might be a substantial issue that affects not only inclusive education for pupils with special needs, including pupils with CI, but also their teachers will be stressed. Kyriacou (2009) states that pupils' disruptive behaviour is one of the main stressors experienced by school teachers. Nash, Schlösserb and Scarr (2015, P: 2) define the

disruptive behaviour as *''any behaviour that is sufficiently off-task in the classroom, as to distract the teacher and/or class peers from on-task objectives''.* Therefore, mainstream classroom as has large sizes of students, managing such classroom behaviour effectively should be taken into account so pupils with CI can be included to this classroom. This issue was also explored in this study. Participants were asked whether such negative issues existed in schools and their impact upon inclusive education.

Regarding the participants' responses to what extent such negative issues existed in schools, the results show that 55% (n = 11/20) of the participants stated there was no such stigmatising behaviour and bullying in the classroom or within the school, whereas only 15% (n = 3/20) of the participants affirmed this matter. Two of these participants who are parent and teacher of pupil with CI whom study part of school day in mainstream classroom. However, Al-Musa, (2007) believes that accepting the principle of inclusion by school can reduce stigma and marginalization. Also, 30% (n = 6/20) pointed out that pupils with CI sometimes faced such attitudes. One father reported that *"there is bullying in terms of taking the device off my child; spilling water on his head; although playing".* The teachers also argued that *"pupils with special needs face ridicule or sarcasm regardless of their type of disability"* (Chapter 5). Ashencaen Crabtree a (2007. p: 49) found that:

> ''In common with other Middle Eastern countries, social stigma is prevalent and this impacts upon the disabled child as well as the mother. However, this is in turn ameliorated by the influences of religion, which constitute an example of family resilience, in addition to the strides made in social development in this region''

Although the majority of responses to this stigmatising and distributive behaviour was positive, such issues reported by both parents and teachers of pupils with CI should be taken into account by schools. Otherwise, these issues might significantly

hinder these pupils, not just in relation to being educated in a mainstream classroom, but also because they might affect these pupils' motivation to study generally.

Issues were highlighted by parents and teachers as factors that could promote the educational progress for pupils with CI, typically presented as factors promoting inclusive education. The early age of implantation, pre- and post-rehabilitation, and teacher ability are all key factors for achieving inclusive education. Furthermore, the importance of school staff awareness of CI, a speech therapist available at the school, the school being prepared in terms of facilities, and the total number of pupils on school roll were highlighted by both parents and teachers. Also, Individual Educational Plans and flexibility in regulations for examinations, for instance, might also promote the inclusion of pupils within mainstream classrooms.

An effective educational environment might be an essential issue for pupils with CI, regardless of the type of educational setting. One parent stated that *"creating and preparing an effective educational environment which is suitable for pupils with CI is more important than considering whether it is inclusive or exclusive education"* (Chapter 5). Also, Ainscow et al. (2006) argue that all groups of learners should participate and be enhanced educationally by schools, rather than simply focusing on increasing their numbers in school.

Fitzpatrick & Olds (2015) claim that the number of children with profound deafness educated in classrooms alongside peers with normal hearing has increased as a result of the availability of cochlear implants. Therefore, surely creating an effective education environment enhanced this increased number and is what inclusive education is all about.

6.5 Implications of Findings

6.5.1 Contributions to Theoretical Knowledge

This study appears to be considered the first to be conducted in terms of the benefit of CI upon the educational progress and inclusive education of deaf pupils with CI in primary schools in Saudi Arabia. Three databases were searched in order to identify related research but no such material was found. These databases were: SDL (Saudi Digital Library), ERIC (Education Resources Information Centre) and the Arab Bureau of Education for the Gulf States. A few researchers had studied CI, but from either a medical or audiological point of view. There were also a small number of studies investigating receptive and expressive language skills (Kamal & Abdulhammed, 2012).

6.5.2 Implications for Policy and Practice

This study has implications for policy and practice in terms of inclusive education and schools. The majority of pupils with CI involved in this study were being educated either in a special school or a special unit attached within a public school. The absence of an inclusive culture and regulations that authorise the inclusive education might be one of the reasons for not mainstreaming deaf pupils with CI. Moreover, the extent of accurate and clear evaluation tests which are implemented by the Administration Committee at the local education authority in order to refer deaf pupils with CI to the appropriate education setting should be taken into consideration.

This is because such evaluation should focus upon potential development aspects of deaf pupil and thus it originates from positive basis which support the pupil rather

than only to find his/her weakness. Also, not only the evaluation of deaf pupils with CI ability should be implemented but also continues follows up must be carried out for this pupil in order to provide him/her an appropriate intervention. For instance, if deaf pupil with CI was referred to segregate education setting and by such continues evaluation, teacher might be able to have a decision that whether movements to mainstream classroom can be taken. Furthermore, conditions which evaluation tests are delivered such as location and whether pupil and his parents are informed about the nature of these tests should be taken into consideration.

Teamwork, which involves a multidisciplinary approach, and its importance for the educational progress of these pupils does not as yet exist in SA. The need for such an approach should be taken into account by the Ministry of Education so that such a team could be available in schools and become slandered practice across SA.

With respect to teacher training, specialist courses should be provided for teachers of pupils with CI in order to enhance these pupils' learning. For instance, courses on implementing individual educational plans for pupils with CI in different subjects could be provided. Training courses, as part of rehabilitation programmes, could also be conducted on developing teachers' skills in order to improve the receptive, expressive and speech intelligibility of these students. Awareness of the nature of CI could also be raised for all school staff through the delivery of training. Also, school facilities such as FM system need to be supported and available for deaf pupils with CI.

6.5.3 Methodological Implications for Research in SA

This section will present the methodological implications for research that could be implemented in SA. In order to enhance the learning ability of pupils with CIs, an

evidence-based education approach needs to be followed in the Kingdom. This approach relies on the outcomes and conclusions that different researchers recommend based on their investigations and data. As there is a significant gap in the research in SA, relate to CI a 'research culture' needs to be created amongst members of the community. Teachers, head teachers and supervisors who work with educational administrators also need to be encouraged to become involved in research. These educators might need to be made aware of the importance that might be gained from the research for their work in the field (Hermsley & Sharp, 2003). Furthermore, an effective relationship needs to exist between schools and researchers. Harlen and Crick (2004) argue that a lack of contact between researchers and educational associations might be one of the factors having a negative impact that hinder benefit from researches.

It was observed that the participants, whether parents or teachers, preferred questionnaires to other methods, such as interviews and observation. This might be because a questionnaire does not need a specific time and place to be conducted. It might also simply be the case that the participants were familiar with the questionnaires, as this method of gathering information is applied in the majority of research conducted in SA. Algthah (2015) indicates that questionnaire is the most common method of educational research compared to other methods, because many researchers believe that this method is convenient to their participants and does not require a significant effort in design, distribution and collection.

In future, the purposes of and processes involved in interviews or observations could be explained to participants, so that the objectives of these methods can be

understood. This might be reflected in such methods being more acceptable for eliciting different kinds of responses.

6.6 Strengths and Limitations

With respect to the research design and implementation of the current study, there are various strengths and limitations which need to be acknowledged. In terms of strengths, the parents' collaboration and interest in this study were one of the strengths that enhanced the data collection. The collaboration that was given by both the hospitals and the educational administration for boys in Riyadh was also a substantial help in completing the pilot study and providing logistical assistance to contacting the participants (parents of deaf pupils with/without CI, teachers and clinicians). Such assistance enhanced the quality of data, as different school areas and participants could be involved with research study.

Participating of all potential stakeholders who are children using CI and their parents, teachers of these children and clinicians strength this study as experiences and perceptions from different perspectives have been incorporated into the study. This involvement allowed exploring to what extent are the agreement of these participants' experiences and perceptions. In addition, from the research knowledge, this is the only study which researched CI and involved parents, teachers and clinicians at the same study.

Clinicians were involved in this study, which is mainly related to the educational filed, because such participants could enhance the findings as indication to the benefit of CI management. Also, clinicians show their experiences not only in the

medical aspects but also their concerns in educational, social and daily life of deaf children with CI so that they can work all together with parents and teachers.

The number of participants (n=196) is an additional strength of the study compare to other studies that were conducted in SA. For instance, Kamal & Abdullhammed (2012) has only four participants and Saddiq (2013) has only five. However, participants in the later study, both boys and girls were involved. Nevertheless, it is important to point out that the aim and purposes of the current study and these earlier studies are different.

There was a limitation in terms of the populations who were involved, as this study was conducted in one city in the Kingdom of Saudi Arabia: Riyadh. The gender in this study was also limited to males. Schools are segregated in the Kingdom and, therefore, a male researcher cannot access either female schools or education administrations. Although questionnaires can be sent by post to these schools, this would have caused significant difficulties in terms of explaining the aims and requirements of the research and the elements of the instruments. Tracking and collecting these questionnaires might also have been difficult.

In this chapter (the discussion chapter), the findings were discussed in the light of relevant literature and the research questions. The subsequent chapter will be Conclusion (Chapter7). This chapter is divided into two parts: firstly, recommendations are made based on the findings and, secondly, conclusions are drawn.

Chapter 7: Conclusion

As parents of deaf children with/without CIs, teachers and clinicians were involved with the current study, this study offers insight into the present situation of the educational status of deaf pupils with CIs in Riyadh in SA. The study also identified the factors affecting the benefits of CI, not only those that are related to the cochlear implants themselves, but also school-related factors and the role of administration and heightening awareness, which seem to be dimensions that affect the outcome of CI in the Kingdom of Saudi.

This research study explored the benefits of CI upon the educational progress of pupils with this treatment and the advantages and disadvantages of CI from the perspective parents, teachers and clinicians. The differences between these pupils' academic attainments and those of deaf students without CIs were also highlighted. Factors that affect the successful outcomes of CIs were discussed. This research also investigated the impact of CIs upon the educational placement of pupils with these devices, based on exploring the current situation of these students' educational settings and from the perceptions and experiences of parents and teachers. Furthermore, the role of environment, which could potentially affect the educational placement of these students, was discussed in detail.

What is the parental decision-making process regarding whether to have a CI for their deaf child?

Parents of deaf pupils with CIs had positive perceptions with regard to the expected outcome of this management prior to deciding to have the device for their child. Nearly half the parents held a high level of expectations regarding the benefits of CI treatment for their child. There was also a moderate level of expectation felt by other

parents involved in the study, while a low level of expectations was registered by small percentage of these parents. This might give an indication that positive expectations of CI benefits could enhance parents' decision to have this intervention for their child. This positive expectation also enhanced these parents' decision to proceed with CI surgery for their child, even if some of the parents were being made aware of negative outcomes prior to making the decision. Parents might be keen to help their child and be optimistic towards this treatment and look forward to their child's development.

It appears that parents' expectations were met by their child's educational progress and outcomes after having a CI. The majority of the parents held a high-to- moderate level of expectation towards the outcomes of CIs prior to surgery, and after the surgery, high percentage of these parents agreed that CI had had a positive impact upon their child's educational progress. It was not just a high percentage of parents who agreed with this impact; the teachers and clinicians also had this experience after surgery.

With respect to parents of deaf children without a CI, there was a lack of awareness regarding CI and ways of obtaining this treatment. As shown in Discussion chapter, a high percentage of these parents stated that they had not had any information regarding CI, so they could not offer any perceptions regarding their benefits. However, there are other parents who had positive expectations of CI outcomes, such as improved hearing, speech, education, the ability to socialise and inclusion, while only a small number of these participants highlighted that a *"CI does not help deaf pupils"*. Thus, the reason for not having CI from the perception of parents of deaf without CIs was not against this management. Because, it can be seen that there was only a small percentage of parents who were against their child having a CI, while

the majority either could not provide a perception towards the CI due to lack of awareness or had positive expectations of such treatment.

The most common for reasons given by parents of deaf pupils for not having a CI were lack of information and awareness and the risks to health (complications). Also, there are other parents of deaf pupils without CIs who selected a low expectation of outcomes as a reason for not having CI for their child. The lowest percentage was given to the high cost, which might be because the surgery is fully funded by the government. However, families have to pay for rehabilitation programmes and the maintenance of the device or materials, which are considered expensive.

This lack of awareness might also result in formulating other reasons and cause parents to expect that there were risks to health (complications) and to have a low expectation of outcomes. Thus, this might reduce the perception that CI might not have a positive impact upon deaf pupils, as some of the parents did not make such a decision. Therefore, there is the potential of having a CI for their child if they are made aware of this treatment at the right time i.e., before the child reaches five years of age. The absence of screening newborns, which was approved only recently, in 2015, might have played a role in this lack of awareness.

What are benefits of CI upon the educational progress of deaf pupils at primary school in Riyadh?

According to the experiences of parents, teachers and clinicians, there are substantial benefits from CIs for the educational progress of deaf pupils with this device. As discussed in chapter 6 (Discussion), a high percentage of the participants – parents, teachers and clinicians agreed that CI have a benefits upon deaf pupils' educational progress. However, it is also worth pointing out that there was a variation in the

participants' percentages. A clear majority of both parents and clinicians agreed on this matter, whereas there was a variation in the teachers' responses.

Improved hearing, educational achievement, language and speech, psychological and social aspects, more inclusive education and greater independence were stated by parents, teachers and clinicians as advantages gained by children/pupils/patients using CIs. These advantages could have a benefit in making the learning process easier for pupils with CIs as a result of their being able to understand instructions and realising and identifying academic activities, whether in the classroom or at home. However, it was mentioned by participants that there were some cases amongst pupils with CIs of children who had attained a poor educational level.

Common disadvantages of CI were also reported by parents, teachers and clinicians, such as the negative impact and risk of surgery, the high cost, rehabilitation programme-related issues and delays in language and academic attainment. The appearance of the device and its negative implications for pupils were mentioned by the parents and teachers but not the clinicians.

With respect to academic performance, the overall educational progress of deaf pupils with CIs showed an average level of performance in all subjects. This indicated that the mean of their educational performance was between mark 1 (the student had mastered all the skills prescribed in the course) and mark 2 (the student had mastered 66% of the prescribed skills or more, including the minimum required skills). Moreover, although the educational progress of pupils with CIs was at a relatively average level, their attainment might be considered satisfactory because the percentages of students who had mastered all the skills prescribed in the course were

high compared with those pupils' percentages at lower attainment scales in the same subjects.

Variables such as the time of implantation, parental expectations, the father's and mother's hearing level, the number of deaf family members, early intervention, the length of time spent using a microphone and sound processor (external part) in school and communication approaches were taken into account in this study. These variables were used to examine pupils' educational performance in the subjects of mathematics, reading and writing. Having a CI at the age of four or younger was found to have a positive improvement upon educational progress. Father's and mother's hearing level, length of time spent using a microphone and sound processor (external part) in school and the oral-audio communication approach might also raise the percentages of pupils who had achieved all the skills required in mathematics, reading and writing. However, the existence of more than one deaf member in a family and having an early intervention programme showed variations for educational performance in both mathematics and in writing and reading.

The academic differences between deaf pupils with and without CIs in their attainment were shown to be in favour of pupils who had a CI in three subjects. These three subjects are in Maths and Reading and Writing and Science. The attainment of pupils with CIs was lower than that of pupils without CIs in Religious education, Art and PE. However, in the case of the curriculum subject of social education, both groups had the same level of academic attainment. Chi-squared analysis was undertaken to examine whether there was a significant difference in performance in the various subjects between the two groups. The findings were statistically non-significant at the 0.05 level in all subjects.

Factors affecting the educational progress of deaf pupils with CIs from the participants' perceptions and experiences, were using both quantitative and qualitative methods. With respect to the quantitative data, these factors were identified as follows:

1. The kind of communication methods and length of time spent using the external part of a CI in school.
2. Rehabilitation programmes, their availability and adequate regulations issued by authorities that are concerned with providing rehabilitation, education and teaching services to students with CIs.
3. Early intervention and the role of the family.
4. A teamwork approach.
5. More than one deaf member of the family and the nature of the rehabilitation programme.

Regarding the qualitative data, factors that are related to the school dimension were investigated by interviewing parents and teachers of pupils with CIs. From the participants' experiences and perceptions, professional staff and the quality of teaching, the curriculum, the school facilities and FM systems in the classroom and at home had an influence on the educational benefits of CI. Also, it suggested that universities and Higher Education can play an important role for teacher training progress that enhancing capability of professionals working with deaf population. A lack of these factors in schools in which pupils with CIs study currently was also noticed.

The benefits of CI upon the educational placement of deaf pupils with CIs at primary school in Riyadh

Regarding the benefits of CI upon educational placement, the current educational settings of the pupils with CIs who were involved in this study in primary schools in Riyadh would not be the desired outcome, as the majority of these pupils with CIs had not yet been included within mainstream classrooms. Hearing impaired units attached within mainstream schools seem to have been the dominant educational settings currently for the pupils with CIs who were involved in this study. It is crucial to highlight that no pupil in this study was registered to study in a mainstream classroom. However, there was a low percentage of students with CIs who studied in an integrated setting, which are mainly found in special units and integrated with mainstream classrooms for part of the school day. Furthermore, in this study, quarter of the pupils with CIs studied in a deaf classroom, either at a deaf school or a deaf unit attached to a mainstream classroom.

However, according to the majority of the parents and teachers of deaf pupils, CI can enhance the inclusive education of pupils by helping to support independence, participation, student voice and academic ability. Nevertheless, a variation in participants' responses was registered regarding the statement that, with the help of a CI, students could study in a mainstream classroom along with their hearing peers: the percentage of parents was nearly doubled the teachers who agreed on this matter. However, there was only small percentage of both groups, parents and teachers, who disagreed with the statement that, with the help of a CI, students could study in a mainstream classroom along with their hearing peers.

Regarding stigmatising behaviour and bullying, which could affect inclusive education in schools, the results show that just above half of the participants (parents and teachers) stated there was no such stigmatising behaviour and bullying in the classroom or within the school, whereas the rest of participants either affirmed this took place or pointed out that pupils with CIs sometimes faced such attitudes. Medical-related reasons that negatively affect outcomes of CIs, such as the impairment of hearing that has not been improved by CI surgery, lack of speech rehabilitation, the late age of implantation and different obstacles to inclusive education, were pointed out by participants as factors in referring pupils with CIs to special schools and deaf units in public schools.

The following section presents directions and recommendations for future research, based on the findings of the current study.

Directions and Recommendations for Future Research

The current study explored the benefits of CIs for the educational progress and placement of deaf pupils with CIs in primary school in Riyadh in Saudi Arabia and clearly raised the need for further research. Investigating the differences in educational performance between deaf pupils with CIs and hearing students is recommended for future research. This comparison would be important, as it has not yet been conducted in SA. It could also provide different points of view in terms of the impact of CIs based on this difference, rather than comparing pupils with CIs with deaf pupils without CIs. Moreover, this study could be conducted in the future with female pupils who have CIs, in order not only to identify differences between male and female students, but also to investigate the current educational situation of female pupils with these devices.

Although, in this study, the language and speech intelligibility of pupils with CIs had improved, according to their parents, teachers and clinicians, this improvement was classified by some of these participants as not being at the desired level. Therefore, future research could examine to what extent the language and speech of pupils with CIs are weak. For example, by identifying and classifying words, sentences and components which these pupils might find difficulty in reading or understanding so that an appropriate teaching strategy could be recommended.

The impact of developed technology upon the educational progress of pupils who have CIs could also be investigated further. In this study, the participants mentioned that new technology could enhance the communication skills of pupils with CIs. Thus, an FM system in the classroom and different versions of CIs could be investigated in more detail in order to examine to what extent these variables affect the outcomes of CIs. It is suggested that future research could examine to what extent teachers of pupils with CIs have knowledge and experience of the assistance of technological tools that are used in teaching pupils with hearing impairment, including those with a CI.

Recommendations for Good Practice

This study could provide an insight for learning deaf pupils with CIs as it highlighted for the first time in the SA the current situation of the educational progress and placements for these pupils not only from the tringle stakeholders (Parents, Teachers and Clinicians) but also according to the reality of academic performance and education settings. Therefore, as this research findings are relevant to whole Saudi, generalisability of these findings and recommendations can be applied not only for Riyadh city but also for the whole Saudi.

Although inclusive education could be enhanced with the help of CIs, the current educational settings of pupils who have this intervention was not compatible with this perspective. There is a lack of educational environmental support with regard to deaf pupils with CIs, so that it is not effective in providing and adapting all the necessary conditions so that pupils with CIs can be included in mainstream classrooms. Furthermore, teacher ability, school staff awareness of CIs, a speech therapist being available at the school, the school being prepared in terms of facilities, and the total number of pupils within the school were all highlighted by both parents and teachers as key factors for achieving inclusive education. The procedures of enrolment for deaf pupils with CIs are also not effective, and need to be revised. The lack of an inclusive school culture and a policy that would regulate and enhance such schools seems to have had an effect upon including these students within mainstream schools.

In conclusion, as mentioned, this study appears to be the first to be conducted in terms of the benefits of CI for the educational progress and placement of deaf pupils with CIs in primary schools in Saudi Arabia. Educational progress and placement were investigated in this study as these issues have a significant impact upon the life of a deaf pupil who has a CI, as well as his/her family and development educationally and socially and in his/her future career. Hence, educational progress and placement were chosen to be the indicators of the outcomes of CI, rather than focusing only on reading perception or speech intelligibility, as appears to be the case in the majority of research studies in this field.

On the basis of findings, the benefits of CI for the educational progress and placement of deaf pupils with CIs in primary schools in Riyadh could be clearly be improved future. There is the potential for development to be implemented in order

to achieve a better outcome for such management. However, despite the positive outcomes of CI from the participants experiences and perceptions and also to the academic attainments, the majority of pupils with CI studying in the year below the year that they are supposed to be at for their chronological age. Also, the majority of pupils with CI involved in this study are educated at units/classes attached to mainstream school but not within mainstream classroom where their hearing peers are. Such situation in this study could be attributed to the time of implantation as the mean of age at CI implantation in this study was 4.5-5 years old. Because the earlier age of implantation is the more positive outcomes of CI. However, the school-related factor also play a significant role in such results. Moreover, as the inclusive education setting can enhance the outcome of pupils with special needs, the dominating education setting in this research was not inclusive education. The lack of rehabilitation programmes also involved as one of the substantial factor could affect the educational outcome of pupils with CI from parents, teachers and clinicians experience and perceptions.

A substantial contribution can be taken place by this research in terms of research, policy and practices as this study enhanced understanding of the current situation in Saudi Arabia. Also, there is a potential that such situation could be improved in SA.

Appendices

Appendix 1: Questionnaire addressed to parents of deaf pupils with cochlear implants at primary schools in Riyadh

Dear Parents

Thank you very much for your cooperation. I highly appreciate your participation in filling out this questionnaire which is part of researcher`s PhD thesis. It deals with the benefit of cochlear implants on the educational progress and placements of deaf students and factors that can either enhance or reduce benefiting from it.

I would like you to fill in the form in the light of your perceptions and experiences towards the cochlear implants and its benefit upon deaf pupil. Then, please fill in the form in the light of your child educational achievements and please circle the number which represents your agreement with the statements also in parts 4 and 5 as it is illustrated in each section of the questionnaire.

Thank you again for your collaboration and I am very happy to receive any comments or inquiries.

Researcher

Mohammed Albanyan

PhD student at university of York

Email address: ma851@york.ac.uk

Part One:

General Information (Please complete following items by circling/ ticking your response)

1- Student age (Date of birth)

2- Student study stag:
(first, second, third, fourth, fifth, sixth) year

3- What is the hearing grade of the parents?
Father:
a. No hearing impairment
b. Mild hearing impairment
c. Moderate hearing impairment
d. Profoundly deaf

Mother:

a. No hearing impairment
b. Mild hearing impairment
c. Moderate hearing impairment
d. Profoundly deaf

4- Is there any other member of the family who is deaf or hearing impaired
a- Yes
b- No
c- If yes please give details (i.e how many one)
…….

5- Has student obtained a rehabilitation programme before joining the school?
a. Yes
b. No
c. If yes, please give details……

6- Does student use the cochlear implants (microphone and sounds processor) all the day at school:
a. Yes
b. No
c. For a limited period

d. Other, please specify……..

7- The type of communication utilized by the student at school:
a. Sign language
b. Total communication approach.
c. The audio-oral approach
d. Other, please specify……..

8- Kindly specify the type of educational setting for your child:
a- Special school for deaf.
b- Deaf units attached within mainstream school.
c- Hearing impaired units attached within mainstream school.
d- Mainstream classroom.
e- Other please specify……

10- Please specify your qualification
a. High school certificate
b. Bachelor degree
c. Master degree
d. PhD
e. Other specify…….

Part two: Experiences towards the benefit of cochlear implants upon the Educational progress

Please answer the following questions:

1. Has cochlear implant surgery made any difference to your child educationally progress at school?

……
……
……
……

2.What do you think about advantages of cochlear implant?

……
……
……
……

3.What do you think about disadvantages of cochlear implant?

……
……
……
……

4. If would like to add any further comments related to the effect of cochlear implants on the educational attainment and inclusive education of deaf student, kindly write it down here

……
……
……
…….

Part three: Educational progress at school by academic report

3. a) Please encircle the appropriate level and fill in this form with respect to your child educational achievements. The levels in the questionnaire represent the level of the student in the subject (assigning symbols from 1 to 4). The symbols indicate whether:

1- The student has mastered all the skills prescribed in the course

2-The student mastered 66% of the prescribed skills or more including the minimum required skills

3- The student mastered at least the minimum required skills

4-The student has not mastered all the minimum required skills

Number	Statement	The Student level
1	The level of the student in mathematics is	1 2 3 4
2	The level of the student in reading and writing is	1 2 3 4
3	The level of the student in religion is	1 2 3 4
4	The level of the student in science is	1 2 3 4
5	The level of the student in social education is	1 2 3 4
6	The level of the student in arts is	1 2 3 4
7	The level of the student in physical education is	1 2 3 4

Part four: perceptions towards the impact of CI upon inclusive education. From your own experience as a parent, kindly circle the number which represents your agreement with the following statements (strongly agree to strongly disagree). The scale is graded from the highest point receiving number (5) to the lowest point receiving number (1).

Number	statement	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
1	Student with CI can develop good relationships with his peers	5	4	3	2	1
2	Student with CI could manage all his personal needs in school without outside help	5	4	3	2	1
3	Student with CI can deal with daily problems he faces inside school	5	4	3	2	1
4	Student with CI can exercises physical activities inside school	5	4	3	2	1
5	Student with CI could competes in practising physical activities and games in school	5	4	3	2	1
6	Student with CI could participates in educational and artistic programmes as extra-classroom activities	5	4	3	2	1
7	Student with CI can expresses his educational needs inside school to his teachers and peers	5	4	3	2	1
8	Student with CI can expresses his feelings inside school to his	5	4	3	2	1

	teachers and peers					
9	By cochlear implants benefit, deaf student could improve his/her educational achievement effectively	5	4	3	2	1
10	By cochlear implants benefit, deaf student could study in a mainstream classroom along with his/her hearing peer	5	4	3	2	1
11	By cochlear implants benefit, and placing student in first row in classroom, student could enhance learning experience	5	4	3	2	1

Please give your answer of the follows question:

I prefer that my child who has CIs study at:

a- Mainstream classroom
b- Hearing impaired units attached within mainstream school.
c- Deaf units attached within mainstream classroom
d- Special school for deaf
e- Others please specify……

Could you please state the reason of your choice about the above alternatives?

……
……
……
……
……
……

Part five: perceptions towards factors that might affect benefit from cochlear implants

5.a) This part aims at identifying your opinion concerning factors that might promote or hinder benefitting from it, with respect to the educational progress of the student from your own perspective as parents.

Please answer and circle the response which applies to you:

1- When did your child's cochlear implant surgery take place? (i.e age of child)

2- Does your child have a cochlear implant:
   a- In one ear only
   b- In both ears

3- What are the sources of information that you relied upon when the decision was made

……
……
……
……

4-Please circle the educational setting that your child study at before the CI surgery

   a- Special school for deaf.
   b- Deaf units attached within mainstream school.
   c- Hearing impaired units attached within mainstream school.
   d- Mainstream classroom.
   e- Other please specify……

5-Please what the range of your child hearing degree after CI surgery:

   a- 20db to 34db
   b- 35db to 54db
   c- 55db to 75db
   d- Over 75db

6- What were your pre-expatiations regarding your child's educational progress with his/her cochlear implants in prior cochlear implant surgery

a -High level b- Average level c- Low level

7- Were you made aware of possible negative outcomes that might occur with having cochlear implants in terms of educational and language outcomes? Yes - No

If Yes please explain

……
……
.

8- Were you made aware of the different range of potential benefits of cochlear implants surgery? Yes – No

If Yes please explain

……
……
…… .

5.b) From your own experience as a parent, kindly circle the number which represents your agreement with the following statements (strongly agree to strongly disagree). The scale is graded from the highest point receiving number (5) to the lowest point receiving number (1).

Number	statement	Strongly Agree	Agree	Don't know	Disagree	Strongly disagree
1	Age of cochlear implants surgery strongly affects the benefit a student gets from it educationally	5	4	3	2	1
2	An early identification of the hearing impairments strongly affects the benefit a student gains from cochlear implants surgery	5	4	3	2	1
3	Rehabilitation programs play an important role in the progress a student makes educationally and linguistically	5	4	3	2	1
4	Many useful rehabilitation programs are available in Riyadh. They provide services to the deaf after the cochlea is implanted	5	4	3	2	1
5	School and the rehabilitation centres provide the students and their parents with all the information related to the location and means of obtaining deaf rehabilitation services and those that provide speech training	5	4	3	2	1
6	Student and his parents have a clear idea about the type and means of obtaining the deaf rehabilitation and speech training services offered by the schools or the rehabilitation centres after the implantation	5	4	3	2	1
7	Offering educational services to students who already have had a cochlea implanted via a team that has different specialties is a prerequisite for the student`s success	5	4	3	2	1

8	Student and his family should get involved in drawing up educational plan which is offered to student at school and rehabilitation centres. This a prerequisite for the student`s success	5	4	3	2	1
9	Family of student with a cochlear implant plays a significant role in developing his/her educational achievements	5	4	3	2	1
10	Type and length of rehabilitation program that supports educational services play a role in the level of the achievement of student with a cochlear implant	5	4	3	2	1
11	From my experience, I can claim that presence of more than one hearing-impaired individual in a family has a negative impact on performance of the student with a cochlear implant	5	4	3	2	1
12	Laws and regulations issued by authorities that are concerned with providing rehabilitation, education and teaching services to students with a cochlear implant are effective in that they deliver required services adequately.	5	4	3	2	1
13	Length of microphones (sound processor) plays an important role in determining benefit a student draws from the implanted cochlea.	5	4	3	2	1
14	Approaches of dealing with student(total communication, use of sign language, audio-oral method)play a significant role in enhancing benefit of the cochlear	5	4	3	2	1
15	Disregarding sign language and relying on the audio-oral program is optimal method to enhance vocabulary and speech ability	5	4	3	2	1

16	Schools or the rehabilitation centres offer training programs to the parents of the students who already have cochlear implants. The courses orient them to how they can deal with their sons and daughters psychologically, educationally and socially	5	4	3	2	1

Dear Parent

If you would like to add any further comments related to factors that might reduce or enhance using of cochlear implants, kindly writ here.

.....
.....
.....
.....

Appendix 2: Questionnaire addressed to parents of deaf pupils without cochlear implants at primary schools in Riyadh

Dear Parents

Thank you very much for your cooperation. I highly appreciate your participation in filling out this questionnaire which is part of researcher`s PhD thesis. It deals with the benefit of cochlear implants on the educational progress and placements of the deaf students and the factors that can either enhance or reduce benefiting from it.

I would like you to fill in the form in the light of your perceptions towards cochlear implants surgery. Also, please give reasons for not having cochlear implants and your perception towards the cochlear implants. Then, please fill section number three in the light of your child educational achievements.

Thank you again for your collaboration and I am very happy to receive any comments or inquiries.

Researcher

Mohammed Albanyan

PhD student at university of York

Email address: ma851@york.ac.uk

Part One:

General Information (Please complete following items by circling/ ticking your response)

1- Student age (Date of birth)

2- The student study stag:

(first, second, third, fourth, fifth, sixth) year

3- What is the hearing grade of the parents?

Father:

a. No hearing impairment

b. Mild hearing impairment

c. Moderate hearing impairment

d. Profoundly hearing impairment

Mother:

a. No hearing impairment

b. Mild hearing impairment

c. Moderate hearing impairment

d. Profoundly hearing impairment

4- Is there any other member of the family who is deaf or hearing impaired

a- Yes

b- No

c- If yes please give details (i.e how many one and his/her hearing impairment level)
…….

5- Has the student obtained a rehabilitation programme before joining the school?

a. Yes

b. No

c. If yes, please give details…….

6- Does the student use a hearing aid at the school:

a. Yes

b. No

c. For a limited period

d. Other, please specify……..

7- The type of communication utilized by the student at school:

a. Sign language

b. Total communication approach.

c. The audio-oral programme

d. Other, please specify……..

8- Kindly specify the type of educational provision for your child:

a- Special school for deaf

b- Deaf units attached within mainstream school

c- Hearing impaired units attached within mainstream school

d- Mainstream classroom

e- Other please specify……

9- Please specify your qualification

a. High school certificate

b. Bachelor degree

c. Master degree

d. PhD

e. Other specify…….

Part two: Parents perceptions towards cochlear implants surgery

1) As your child has not cochlear implants, please give reasons for not having cochlear.

(Please answer by circling/ ticking as many reasons as you wish)

Reasons for not having cochlear implants are:

a. Risks of health as consequences of the surgery.
Yes- No

b. There is not enough information and awareness that could be provided by

different authorities to be relying on in order to get the decision.
Yes - No

c. Low expectations of outcomes that might be with having cochlear implants

in terms of educational and language outcomes.
Yes - No

d. Other reasons (please give details)

……..
……
……..
……..

e. Please give further details or your response to this question.

……
……
……
……
……

2) What are your perceptions towards using the cochlear implants and its benefit upon deaf pupils?

……
……
……

……
……
……

……
……
……

……
……
……

Part three: Educational progress at school by academic report

Please encircle the appropriate level of the student who and fill in this form with respect to your child educational attainment. The levels in the questionnaire represent the level of the student in the subject (assigning symbols from 1 to 4). The symbols indicate whether:

1- The student has mastered all the skills prescribed in the course

2-The student mastered 66% of the prescribed skills or more including the minimum required skills

3- The student mastered at least the minimum required skills

4-The student has not mastered all the minimum required skills

Number	Statement	The Student level
Number	Statement	The Student level
1	The level of the student in mathematics is	1 2 3 4
2	The level of the student in reading and writing is	1 2 3 4
3	The level of the student in religion is	1 2 3 4
4	The level of the student in science is	1 2 3 4
5	The level of the student in social education is	1 2 3 4
6	The level of the student in arts is	1 2 3 4
7	The level of the student in physical education is	1 2 3 4

Appendix 3: Questionnaire addressed to teachers of deaf with cochlear implants at primary school in Riyadh.

Dear Teacher

Thank you very much for your cooperation. I highly appreciate your participation in filling out this questionnaire which is part of a researcher`s PhD thesis. It deals with the benefit of cochlear implants on the educational progress and placements of deaf students and factors that could affect benefiting from it. I would like you to fill in the form from your experience as a specialist in dealing with deaf children who have cochlear implants.

Kindly, regarding parts three and four in this questionnaire, circle the number which represents your agreement with the statements (strongly agree to strongly disagree). The scale is graded from the highest point receiving number (5) to the lowest point receiving number (1).There is no correct or wrong answer but the best option is the one that reflects your experience and perspective towards the effect of cochlear implants on the educational progress of deaf pupils and factors which could either reduce or promote the benefits.

Thank you again for your collaboration and I am very happy to receive any comments or inquiries.

Researcher

Mohammed Albanyan

PhD student at university of York

Email address: ma851@york.ac.uk

Part one: general information

Please circle the response which applies to you:

1-Your educational qualification is:

a- B.Ed. in SEN,
b- B.Ed. in Ed.,
c- Diploma,
d- Master,
e- Other please specify……..

2- Have you had any specialised in-services training?

(Yes, No)

3- Have you had Special Education pre-service training?

(Yes, No) If yes would you please specify briefly

.....……

……

4- How many years of teaching experience of deaf students have you had?

a- 5 years or less,
b- 6 to 10 years,
c- 11 to 15 years,
d- 16 to 20 years,
e- 21 years or more

Part two: Experiences towards the benefit of cochlear implants upon the Educational progress

Please answer the following questions:

1. Has cochlear implant surgery made any difference to your pupils' educationally progress at school?

……
……
……
……

2. What do you think about advantages of cochlear implant?

……
……
……
……

3. What do you think about disadvantages of cochlear implant?

……
……
……
……

Dear Teacher

4. If would like to add any further comments related to the effect of cochlear implants on the educational attainment and inclusive education of deaf student, kindly write it down here

……
……
……
……

Part three: perceptions towards the impact of CI upon inclusive education.

From your own experience as a teacher, kindly circle the number which represents your agreement with the following statements (strongly agree to strongly disagree). The scale is graded from the highest point receiving number (5) to the lowest point receiving number (1).

Number	statement	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
1	Student with CI can develop good relationships with his peers	5	4	3	2	1
2	Student with CI could manage all his personal needs in school without outside help	5	4	3	2	1
3	Student with CI can deal with daily problems he faces inside school	5	4	3	2	1
4	Student with CI can exercises physical activities inside school	5	4	3	2	1
5	Student with CI could competes in practising physical activities and games in school	5	4	3	2	1
6	Student with CI could participates in educational and artistic programmes as extra- classroom activities	5	4	3	2	1
7	Student with CI can expresses his educational needs inside school to his teachers and peers	5	4	3	2	1
8	Student with CI can expresses his feelings inside school to his teachers and peers	5	4	3	2	1
9	By cochlear implants benefit, deaf student could improve his/her educational achievement effectively	5	4	3	2	1

10	By cochlear implants benefit, deaf student could study in a mainstream classroom along with his/her hearing peer	5	4	3	2	1
11	By cochlear implants benefit, and placing student in first row in classroom, student could enhance learning experience	5	4	3	2	1

Part four: perception towards factors that might affect benefit from cochlear implants

Number	statement	Strongly Agree	Agree	Don't know	Disagree	Strongly disagree
1	Age of cochlear implants surgery strongly affects the benefit a student gets from it educationally	5	4	3	2	1
2	An early identification of the hearing impairments strongly affects the benefit a student gains from cochlear implants surgery	5	4	3	2	1
3	Rehabilitation programs play an important role in the progress a student makes educationally and linguistically	5	4	3	2	1
4	Many useful rehabilitation programs are available in Riyadh. They provide services to the deaf after the cochlea is implanted	5	4	3	2	1
5	School and the rehabilitation centres provide the students and their parents with all the information related to the location and the means of obtaining the deaf rehabilitation services and those that provide speech training	5	4	3	2	1
6	Student and his parents have a clear idea about the type and means of obtaining the deaf rehabilitation and speech training services offered by the schools or the rehabilitation centres	5	4	3	2	1

7	Offering educational services to students who already have had a cochlea implanted via a team that has different specialties is a prerequisite for the student`s success	5	4	3	2	1
8	Student and his family should get involved in drawing up educational plan which is offered to student at school and rehabilitation centres. This a prerequisite for the student`s success	5	4	3	2	1
9	Family of student with a cochlear implant plays a significant role in developing his/her educational achievements	5	4	3	2	1
10	Type and length of rehabilitation program that supports educational services play a role in the level of the achievement of student with a cochlear implant	5	4	3	2	1
11	From my experience, I can claim that presence of more than one hearing-impaired individual in a family has a negative impact on performance of the student with a cochlear implant	5	4	3	2	1
12	Laws and regulations issued by authorities that are concerned with rendering rehabilitation, education and teaching services to students with a cochlear implant are effective in that they render the required services adequately.	5	4	3	2	1

13	Length of using hearing aid plays an important role in determining benefit a student draws from the implanted cochlea.	5	4	3	2	1
14	Approaches of dealing with student(total communication, use of sign language, audio-oral method)play a significant role in enhancing benefit of the cochlear	5	4	3	2	1
15	Disregarding sign language and relying on the audio-oral program is optimal method to enhance vocabulary and speech ability	5	4	3	2	1
16	Schools or the rehabilitation centres offer training programs to the parents of the students who already have cochlear implants. The courses orient them to how they can deal with their sons and daughters psychologically, educationally and socially	1	2	3	4	5

Dear teacher,

If you would like to add any further comments related to factors that might reduce or enhance using of cochlear implants, kindly writ here

……
……
……
……
……
……

Appendix 4: Questionnaire addressed to clinicians (speech therapist, audiologists)

Dear clinician,

Thank you very much for your cooperation. I highly appreciate your participation in filling out this questionnaire which is part of a researcher`s PhD thesis. It deals with the benefit of cochlear implants on the educational progress and placements of deaf students and factors that could enhance or reduce benefiting from it. I would like you to fill in the form from your experience as a specialist in dealing with deaf children who have cochlear implants.

Kindly, regarding part three, circle the number which represents your agreement with the statements (strongly agree to strongly disagree). The scale is graded from the highest point receiving number (5) to the lowest point receiving number (1). Please indicate your perception towards the factors which could affect the benefits of CI.

There is no correct or wrong answer but the best option is the one that reflects your experience and perception towards the CI surgery and the effect of cochlear implants on the educational progress of deaf pupils.

Thank you again for your collaboration and I am very happy to receive any comments or inquiries.

Researcher

Mohammed Albanyan

PhD student at university of York

Email address: ma851@york.ac.uk

Part one: general information

Please circle the response which applies to you:

1. You work as a

   a. Speech therapist
   b. Audiologist
   c. Other please specify……

2. How many years of working experience have you had?

   a. 5 years or less,

   b. 6 to 10 years,

   c. 11 to 15 years,

   d. 16 to 20 years,

   e. 21 years or more.

Part two: Experiences towards the benefit of cochlear implants upon the Educational progress

Please answer the following questions:

1. Has cochlear implant surgery made any difference to your patients' educational progress?

……
……
……
……

2. What do you think about advantages of cochlear implant?

……
……
……
……..

3. What do you think about disadvantages of cochlear implant?

……
……
……
……

Part three: perception towards factors that might affect benefit from cochlear implants

Number	statement	Strongly Agree	Agree	Don't know	Disagree	Strongly disagree
1	Age of cochlear implants surgery strongly affects the benefit a student gets from it educationally	5	4	3	2	1
2	An early identification of the hearing impairments strongly affects the benefit a student gains from cochlear implants surgery	5	4	3	2	1
3	Rehabilitation programs play an important role in the progress a student makes educationally and linguistically	5	4	3	2	1
4	Many useful rehabilitation programs are available in Riyadh. They provide services to the deaf after the cochlea is implanted	5	4	3	2	1
5	School and the rehabilitation centres provide the students and their parents with all the information related to the location and means of obtaining deaf rehabilitation services and those that provide speech training	5	4	3	2	1
6	Student and his parents have a clear idea about the type and means of obtaining the deaf rehabilitation and speech training services offered by the schools or the rehabilitation centres after the implantation	5	4	3	2	1
7	Offering educational services to students who already have had a cochlea implanted via a team that has different specialties is a prerequisite for the student`s success	5	4	3	2	1

8	Student and his family should get involved in drawing up educational plan which is offered to student at school and rehabilitation centres. This a prerequisite for the student`s success	5	4	3	2	1
9	Family of student with a cochlear implant plays a significant role in developing his/her educational achievements	5	4	3	2	1
10	Type and length of rehabilitation program that supports educational services play a role in the level of the achievement of student with a cochlear implant	5	4	3	2	1
11	From my experience, I can claim that presence of more than one hearing-impaired individual in a family has a negative impact on performance of the student with a cochlear implant	5	4	3	2	1
12	Laws and regulations issued by authorities that are concerned with providing rehabilitation, education and teaching services to students with a cochlear implant are effective in that they deliver required services adequately.	5	4	3	2	1
13	Length of microphones (sound processor) plays an important role in determining benefit a student draws from the implanted cochlea.	5	4	3	2	1
14	Approaches of dealing with student(total communication, use of sign language, audio-oral method)play a significant role in enhancing benefit of the cochlear	5	4	3	2	1

15	Disregarding sign language and relying on the audio-oral program is optimal method to enhance vocabulary and speech ability	5	4	3	2	1
16	Schools or the rehabilitation centres offer training programs to the parents of the students who already have cochlear implants. The courses orient them to how they can deal with their sons and daughters psychologically, educationally and socially	5	4	3	2	1

Dear clinician

If would like to add any further comments related to the effect of cochlear implants on the educational progress of deaf student, kindly write it down here

……
……
……
…….

If you would like to add any further comments related to factors that might reduce or enhance using of cochlear implants, kindly writ here

……
……
……
……
……
……

Appendix 5: Ethical issues audit form

THE UNIVERSITY of York

Education Ethics Committee

Ethical Issues Audit Form

This questionnaire should be completed for each research study that you carry out as part of your degree. You should discuss it fully with your supervisor, who should also sign the completed form.

You must not collect your data until you have had this form signed by your supervisor (and possibly others - your supervisor will guide you).

Surname / family name:	Albanyan
First name / given name	Mohammed
Programme:	PhD Education
Supervisor (of this research study):	Dr. Poppy Nash
Topic (or area) of the proposed research study: Exploring the Impact of Cochlear implants upon Educational outcomes of Deaf pupils in Saudi Arabia	
Where the research will be conducted: Riyadh- Saudi Arabia	
Methods that will be used to collect data: 1- Questionnaires. Interviews	

Supervisors, please read *Ethical Approval Procedures: Students*. Note: If the study involves children, vulnerable subjects, sensitive topics, or an intervention into normal educational practice, this form must <u>also</u> be approved by the programme leader (or UG / PG director if the supervisor is also the Programme Leader); for Research Students, by the TAG member.

It may also require review by the full Ethics Committee (see below).

<u>First approval:</u> By the <u>supervisor</u> of the research study (after reviewing the form):

Please ☑ one of the following options.

☐	I believe that this study, as planned, meets normal ethical standards
☐	I am unsure if this study, as planned, meets normal ethical standards
☐	I believe that this study, as planned, does not meet normal ethical standards and requires some modification.

Signed <u>(Supervisor)</u>: Date:

Supervisor, if the study involves children, vulnerable subjects, sensitive topics, or an intervention into normal educational practice (see *Ethical Approval Procedures: Students*), please pass for second approval to the Programme Leader (or UG / PG director if the supervisor is also the Programme Leader); for Research Students, pass to the TAG member.

If the study has none of the above characteristics, please now pass to the Programme Administrator.

<u>Second approval: by the Programme Leader or UG/PG director (for Research Students, the TAG member):</u>

Please ☑ one of the following options.

☐	I believe that this study, as planned, meets normal ethical standards
☐	I am unsure if this study, as planned, meets normal ethical standards
☐	I believe that this study, as planned, does not meet normal ethical standards and requires some modification.

Signed (Programme Leader or UG/PG director or TAG member):

Date:

Please now pass to the Programme Administrator, unless approval is required by the full Ethics Committee - see below.

Approval required by the Full Education Ethics Committee?

Note to Programme Leader, UG/PG director, or TAG member: If the study involves a) deception, or b) an intervention and procedures could cause concerns, or c) if the topic is sensitive or potentially distressing, review by the full Education Ethics Committee is required. Please pass to the Chair of the Education Ethics Committee via the Research Administrator.

FOR COMPLETION BY THE STUDENT

Data sources

1 If your research involves collecting secondary data only, ***please go to SECTION 2***.

2 If your research involves collecting data from people (e.g. by observing, testing, or teaching them, or from interviews or questionnaires), ***please go to SECTION 1.***

SECTION 1: For studies involving people

3 Is the amount of time you are asking research subjects to give reasonable? YES/NO

4 Is any disruption to their normal routines at an acceptable level? YES/NO

5 Are any of the questions to be asked, or areas to be probed, likely to cause anxiety or distress to research subjects? YES/NO

6 Are all the data collection methods used necessary? YES/NO

7 Are the data collection methods appropriate to the context and participants? YES/NO

8 Will the research involve deception? YES/NO

9 Will the research involve sensitive or potentially distressing topics? (The latter might include abuse, bereavement, bullying, drugs, ethnicity, gender, personal relationships, political views, religion, sex, violence. If there is lack of certainty about whether a topic is sensitive, advice should be sought from the Ethics Committee.) YES/NO

10 Does your research involve collecting data from vulnerable groups? YES/NO

If YES, what steps will you take to ensure that the methods and procedures are appropriate, not burdensome, and are sensitive to ethical considerations?

a- Agreement of parent would be given. b- Letter from Saudi cultural bureau would be provided to both Educational authority and schools regarding the research project.

11 Are the research subjects under 16 years of age? YES /NO. **If NO, go to *question 12*.**

If YES, do you intend to ensure that another adult is present during all interactions with children? YES/NO

If NO, please explain, for example:

i) This would seriously compromise the validity of the research because [***provide reason***]

ii) I have/will have a full Criminal Records Bureau check) YES/NO

iii) Other reasons:

Payment to participants

12 If research participants are to receive reimbursement of expenses, or any other incentives or benefits for taking part in your research, please give details, indicating what or how much money they will receive and, briefly, the basis on which this was decided

---

If your study involves an INTERVENTION i.e. a change to normal practice made for the purposes of the research, go to question 13 (this does not include 'laboratory style' studies i.e. where ALL participation is voluntary):

If your study does not involve an intervention, go to question 20.

13 Is the extent of the change within the range of changes that teachers (or equivalent) would normally be able to make within their own discretion? YES/NO

14 Will the change be fully discussed with those directly involved (teachers, senior school managers, pupils, parents – as appropriate)? YES/NO

15 Are you confident that *all* treatments (including comparison groups in multiple intervention studies) will potentially provide some educational benefit that is compatible with current educational aims in that particular context? (Note: This is *not* asking you to justify a non-active control i.e. continued normal practice) YES/NO

Please **briefly** describe this / these benefit(s).

---

16 If you intend to have two or more groups, are you offering the control / comparison group an opportunity to have the experimental / innovative treatment at some later point (this can include making the materials available to the school or learners)? YES/NO.

If 'NO', please explain:

---

17 If you intend to have two or more groups of participants receiving different treatment, do the informed consent forms give this information? YES/NO

18 If you are randomly assigning participants to different treatments, have you considered the ethical implications of this? YES/NO

19 If you are randomly assigning participants to different treatments (including non-active controls), will the institution and participants (or parents where participants are under 16) be informed of this in advance of agreeing to participate? YES/NO

If NO, please explain:

General protocol for working in educational institutions

20 Do you intend to conduct yourself, and advise your team to conduct themselves, in a professional manner as a representative of the University of York, respectful of the rules, demands and systems within the institution you are visiting? YES / NO

21 If you intend to carry out research with children under 16, have you read and understood the Education Ethics Committee's *Guidance on Working with Children Under 16*? YES / NO

Informed consent

22 Have you prepared Informed Consent Form(s) which participants in the study will be asked to sign, and which are appropriate for different kinds of participants? YES/NO

If YES, please attach the informed consent form(s).

If NO, please explain:

_____

_____

23 Does this Informed Consent Form:

a) inform participants in advance about what their involvement in the research study will entail? YES/NO

b) inform participants of the purpose of the research? YES/NO

c) inform participants of what will happen to the data they provide (how this will be stored, who will have access to it, how individuals' identities will be protected during this process)? YES/NO

d) if there is a possibility that you may wish to use some of the data publicly (e.g. at research conferences or online), have you given participants the opportunity to decline such use of data? YES/NO

e) in studies involving interviews or focus groups, inform participants that they will be given an opportunity to comment on your written record of the event? YES/NO

If NO, have you included this on your consent form? YES/NO

If NO, please explain why not:

---

24 Who will be asked to sign an Informed Consent Form? Please **tick all** that apply:

Category	*Tick if 'yes'*
Adult research subjects	
Research subjects under 16	✓
Teachers	✓
Parents	✓
Head/Senior leadership team member	
Other (please explain)	Clinicians

25 In studies involving an **intervention** with under 16s, will you seek informed consent from parents? YES / NO

If NO, please explain:

If YES, please delete to indicate whether this is 'opt-in' or 'opt-out'

If 'opt-out', please explain why 'opt-in' is not being offered:

SECTION 2

Data Storage, Analysis, Management and Protection

26 I have read and understood the Education Ethics Committee's *Guidance on Data Storage and Protection* YES/NO

27 I will keep any data appropriately secure (e.g. in a locked cabinet), maintaining confidentiality and anonymity (e.g. identifiers will be encoded and the code available to as few people as possible) where possible YES/NO

28 If your data can be traced to identifiable participants, who will be able to access your data?

Reporting your research

29 In any reports that you write about your research, will you ensure that the identity of any individual research subject, or the institution which they attend or work for, cannot be deduced by a reader? YES/NO

If the answer to this is 'NO', please explain:

Conflict of interests

30 If the Principal Investigator or any other key investigators or collaborators have any direct personal involvement in the organisation sponsoring or funding the research that may give rise to a possible conflict of interest, please give details.

Potential ethical problems as your research progresses

31 If you see any potential problems arising during the course of the research, please give details here and describe how you plan to deal with them.

Signed: Mohammed Albanyan Date: 20-05-2013

Please now give this form to your supervisor to complete the section on the first page.

NOTE ON IMPLEMENTING THE PROCEDURES APPROVED HERE:

If your plans change as you carry out the research study, you should discuss any changes you make with your supervisor. If the changes are significant, your supervisor may advise you to complete a new 'Ethical issues audit' form.

For Taught Masters students, on submitting your Masters Dissertation to the programme administrator, you will be asked to sign to indicate that your research did not deviate significantly from the procedures you have outlined above.

For Research Students (MA by Research, MPhil, PhD), once your data collection is over, you must write an email to your supervisor to confirm that your research did not deviate significantly from the procedures you have outlined above.

Appendix 6: Letter from the university regarding conducting the research

THE UNIVERSITY of York

DEPARTMENT OF EDUCATION
Heslington, York, YO10 5DD

Direct Line: (01904) 323455
Fax: (01904) 323459
Email: edoc5100@york.ac.uk
Web: www.york.ac.uk/edu

14th October 2013

Saudi Arabia Embassy
London

Dear Sir/Madam, to whom it may concern,

I am writing to confirm that Mohammed Albanyan is a full-time PhD student in the Department of Education, at the University of York. I am supervising his postgraduate research project.

For the purposes of his PhD research, Mr Albanyan needs to return to Saudi Arabia for several weeks this winter to collect data for his thesis.

If you require further information, please do not hesitate to contact me.

Yours sincerely,

Poppy Nash

Dr Poppy Nash
Lecturer in Education
Email: poppy.nash@york.ac.uk
Direct tel: 01904 322526

Appendix 7: Letter from Saudi Embassy in London to hospital in Riyadh

ROYAL EMBASSY OF SAUDI ARABIA
CULTURAL BUREAU
LONDON

سفارة المملكة العربية السعودية
الملحقية الثقافية
لندن

إفـــادة

التاريخ: 2013/60/04
رقم الملف:S12287/2

تفيد الملحقية الثقافية بسفارة المملكة العربية السعودية في لندن بأن الطالب/ **محمد بن عبدالله بن محمد البنيان** (سجل مدني رقم 1004788129) مُبتعث من قبل وزارة التعليم العالي لدراسة مرحلة الدكتوراة في تخصص Education. حيث بدأ الطالب دراسته في 01/01/2012 ولايزال على رأس بعثته لغاية 31/12/2014.

وقد مُنح هذه الإفادة بناء على طلبه لتقديمها إلى مستشفى الملك عبدالعزيز.

الملحق الثقافي
بسفارة المملكة العربية السعودية في لندن
فيصل بن محمد المهنا أبا الخيل

الرقم : ..... التاريخ : ..... الموافق : ..... المرفقات : .....

630 Chiswick High Road, London W4 5RY Tel: +44 (0) 20 3249 7000 Fax: +44 (0) 20 3249 7001 E-mail: sacbuk@uksacb.org
www.uksacb.org

Appendix 8: Letter from Saudi Embassy in London to Ministry of Education in Riyadh

ROYAL EMBASSY OF SAUDI ARABIA
CULTURAL BUREAU
LONDON

سفارة المملكة العربية السعودية
الملحقية الثقافية
لندن

2013/06/06

رقم الملف: S12287/2

رقم السجل المدني: 1004788129

إفـــــــادة

تفيد الملحقية الثقافية بسفارة المملكة العربية السعودية في لندن بأن الطالب / **محمد بن عبدالله بن محمد البنيان** ملحق بالبعثة لدراسة مرحلة الدكتوراه في تخصص التربية في جامعة يورك اعتبارا من 2012/01/01 و حتى 2014/12/31 وفقا للقرار رقم 2-13632-1433 و تاريخ 1433/02/03.

وبناء على توصية المشرف الدراسي على بحث الدكتوراه سيتقدم المبتعث بطلب الموافقة على القيام برحلة علمية إلى المملكة العربية السعودية لإكمال إجراءات بحثه " استكشاف اثر زراعة القوقعة على الجانب التربوي للطلاب ذوي الإعاقة السمعية في المرحلة الابتدائية (بنين -بنات) بالرياض ".

ونظرا لضرورة إرفاق موافقة من الجهة المستضيفة في المملكة لاستكمال طلب الموافقة على الرحلة العلمية تم منحه هذا الخطاب بناء على طلبه وذلك لتقديمه إلى إدارة التربية والتعليم بالرياض.

الرجاء التكرم بالموافقة على استضافتها

وتقبلوا خالص التحية والتقدير،،،

الملحق الثقافي
بسفارة المملكة العربية السعودية في لندن

فيصل بن محمد المهنا ابالخيل

الرقم : ..... التاريخ : ..... الموافق : ..... المرفقات : .....

630 Chiswick High Road, London W4 5RY Tel: +44 (0) 20 3249 7000 Fax: +44 (0) 20 3249 7001 E-mail: sacbuk@uksacb.org
www.uksacb.org

Appendix 9: Questions for interviews that were conducted with parents and teachers of deaf with CIs

Questions

Q1 What is your perspective and experience regarding pupil with CI educational progress after having such intervention?

Q2 from your experience what factors that could affect benefit of CI?

Q3 What do you think about curriculum which are delivered to your pupil? Should special curriculum be given? Why?

Q4 Could you please give a brief evaluation regarding to what extent teachers of deaf pupils with CIs contributing in enhancing educational progress? (What skills and training they should have)

Q5 Do you think that school is able to embrace deaf pupil with CIs?

Q6 From your experience why some pupils with CIs are educated at either deaf unites or deaf school?

Q7 How the decision is made in terms of referring pupil with CIs to particular education programme?

Q8 From your experience and perspective how pupil with CIs could be helped to be included within less exclusive education environment (mainstream classroom, impaired hearing classroom in mainstream school)?

Q9 What do you think regarding your child's social relationships and communicating with his colleagues, whether in the classroom or the school? Is there a bad behaviour, bulling for example? How it can be minimized or avoided?

Appendix 10: Comments made by participants

Comments made by participants regarding the questionnaire itself (design + contents) were as follows.

Comments by Parents of Pupils with CIs

• Questions about how much effort is made by the child's parents to learn and for rehabilitation, such as attending training courses.

• Whether teachers are qualified or not.

• Do the child either during the family or relatives occasions and meetings integrates with his/her peers in order to acquire new vocabulary or whether he/she is isolated due to fear of downplay or for any other reason.

- In Table B (add):

 Student faces shame if he is asked about hearing aids.

 Student feels that he is isolated from other students.

- Level of parents' qualification.
- Media role.

Comments by Parents of Pupils without CIs

No comments were made.

Comments by Teachers of Pupils with CIs

• "Good questionnaire which tells the reality and the importance of creating a guide to make better use of the cochlear implant. This study consists of procedural steps to improve the reality on the ground for enhancing educational outcomes of deaf pupils with a cochlear implant."

• There are pupils with cochlear implants but they still study in deaf units.

• Teachers of pupils with CIs do not have any idea of their pupils' background before the implants.

• Teachers who work in mainstream classrooms (who are not specialists) must be educated and trained in terms of hearing impaired needs.

Comments by Clinicians: Within the Factors Section

• Item no 2: there is a difference between early discovery and early implants, so the item should be:

An early discovery of the hearing impairment then early implants strongly affects the benefit a student gains from cochlear implant surgery.

• Item no 6: the student and his parents have a clear idea about the type and means of obtaining deaf rehabilitation and speech training services offered by the schools or the rehabilitation centres.

(It should be mentioned whether this is before the implant, during or after.)

• Item no18: needs to be reviewed.

• “Good questionnaire and it has a comprehensive focus on the theoretical and practical side.”

• “It is good because it focuses on one aspect (education).”

• “It would be preferable if social and medical aspects are included.”

Appendix 11: Parent consent form

Researcher project: Exploring the Impact of Cochlear Implants upon Educational Outcomes of Deaf Children in Saudi Arabia

Parent consent form

- I understand that the aim of this project is to gather information on my views on the impact of cochlear implants upon educational outcomes upon children.
- I understand that my participation in this project will take the form of interview, which will last between 30 and 45 minutes.
- I understand that my participation in this project is entirely voluntary and that I can withdraw from participation at any time.
- I understand that if any of the topics discussed make me feel uncomfortable or distressed, I do not have to continue participating in the discussion.
- I understand that the information gathered from me will be confidential (no-one other than the researcher will see or hear my responses) and anonymous (no-one will be able to identify which responses I have given).
- I understand that I will be given an opportunity to see and comment on a written record of this discussion at a later stage.
- I accept that the information gathered from me will be used in academic and other literature to explore the Impact of cochlear implants upon educational outcomes of deaf children in Saudi Arabia.

Signed: _____

Name:

Date:

Thank you very much

Appendix 12: Teacher consent form

Researcher project: Exploring the Impact of Cochlear Implants upon Educational Outcomes of Deaf Children in Saudi Arabia

Teacher consent form

- I understand that the aim of this project is to gather information on my views on the impact of cochlear implants upon educational outcomes upon children.
- I understand that my participation in this project will take the form of interview, which will last between 30 and 45 minutes.
- I understand that my participation in this project is entirely voluntary and that I can withdraw from participation at any time.
- I understand that if any of the topics discussed make me feel uncomfortable or distressed, I do not have to continue participating in the discussion.
- I understand that the information gathered from me will be confidential (no-one other than the researcher will see or hear my responses) and anonymous (no-one will be able to identify which responses I have given).
- I understand that I will be given an opportunity to see and comment on a written record of this discussion at a later stage.
- I accept that the information gathered from me will be used in academic and other literature to explore the Impact of cochlear implants upon educational outcomes of deaf children in Saudi Arabia.

Signed: _____

Name:

Date:

Thank you very much

References

Abdel-Hamid, O., Khatib, O. M. N., Aly, A., Morad, M., & Kamel, S. (2007). Prevalence and patterns of hearing impairment in Egypt: A national household survey. *Eastern Mediterranean Health Journal*, *13*(5), 1170-1180.

Abduljabar, A., & Masoud, W. (2002). *The opinions of principals and teachers towards inclusion programs*. Riyadh: King Saud University.

Ainscow, M. (2005a). Developing inclusive education systems: What are the levers for change? *Journal of educational change, 6*(2), 109-124.

Ainscow, M. (2005b). Understanding the development of inclusive education system. *Electronic Journal of Research in Educational Psychology, 3*(3), 5-20.

Ainscow, M. (2007). Taking an inclusive turn. *Journal of Research in Special Educational Needs*, *7*(1), 3-7.

Ainscow, M., Booth, T., & Dyson, A. (2006a). *Improving schools, developing inclusion*. New York, NY: Routledge.

Ainscow, M., Booth, T., & Dyson, A. (2006b). Inclusion and the standards agenda: Negotiating policy pressures in England. *International Journal of Inclusive Education, 10*(4-5), 295-308.

Ainscow, M., Farrell, P., Tweddle, D., & Malki, G. (1999). *Effective practice in inclusion and in special and mainstream schools working together*. London, UK: DfEE.

Alkhamra, R. A. (2015). Cochlear implants in children implanted in Jordan: A parental overview. *International Journal of Pediatric Otorhinolaryngology, 79*(7), 1049-1054.

Allan, J. (2007). *Rethinking inclusive education: The philosophers of difference in practice* (Vol. 5). Dordrecht, Netherlands: Springer Science & Business Media.

Al-Braheem, N. (2003). Problems facing head-teachers of mainstream schools with hearing impaired programme at the Saudi Ministry of Education (Arabic).

Almanal (2015). *Genetic solutions to deafness*. Retrieved 2015-07-23 from http://www.almanalmagazine.com

Al-Mosa, N. (1999). *The movements of special education in the Ministry of Education in Saudi Arabia*. Riyadh: Ministry of Education.

Alodail, A. K. (2014). Instructing educators in the use of assistive technology listening devices in the classroom. *International Education Studies, 7*(5), 55-67.

Aloheeb, A. (2009). *Early intervention services for children deaf and hard of hearing: its importance and extent of availability from the point of view of specialists in Riyadh*. Unpublished master's thesis, University of King Saud, Riyadh.

Alriyadh Newspaper (2014). *Royal Court approves the establishment of national health centers and early intervention program for disability*. Retrieved 2015-02-17 from http://www.alriyadh.com/999844

American Speech-Language-Hearing Association (ASHA) (n.d.). *About the American Speech-Language-Hearing Association (ASHA).* Retrieved 2013-03-23 from http://www.asha.org/about/

Antia, S. D., Jones, P. B., Reed, S., & Kreimeyer, K. H. (2009). Academic status and progress of deaf and hard-of-hearing students in general education classrooms. *Journal of Deaf Studies and Deaf Education,* 14(3), 293-311.

Appler, J. M., & Goodrich, L. V. (2011). Connecting the ear to the brain: Molecular mechanisms of auditory circuit assembly. *Progress in Neurobiology, 93*(4), 488-508.

Archbold, S., Harris, M., O'Donoghue, G., Nikolopoulos, T., White, A., & Lloyd Richmond, H. (2008). Reading abilities after cochlear implantation: The effect of age at implantation on outcomes at 5 and 7 years after implantation. *International Journal of Pediatric Otorhinolaryngology, 72*(10), 1471-1478.

Archbold, S., & O'Donoghue, G. M. (2009). Cochlear implantation in children: Current status. *Paediatrics and Child Health, 19*(10), 457-463.

Archbold, S., & Wheeler, A. (2010). Cochlear implants: Family and young people's perspectives. In M. Marschark P. E. Spencer (Eds.) T*he Oxford Handbook of Deaf Studies, Language, and Education* (Vol. 2) (226-240). Oxford, UK: Oxford University Press.

Arlinger, S. (2003). Negative consequences of uncorrected hearing loss— a review. *International Journal of Audiology, 42*(2S), 17-20.

Armstrong, D. F., & Wilcox, S. (2007). *The gestural origin of language*. Oxford, UK: Oxford University Press.

Ashencaen Crabtree, S. A. (2007). Family responses to the social inclusion of children with developmental disabilities in the United Arab Emirates. Disability & Society, 22(1), 49-62.

Ashencaen Crabtree, S. A., & Williams, R. (2013). Ethical implications for research into inclusive education in Arab societies: Reflections on the politicization of the personalized research experience. International Social Work, 56(2), 148-161.

Ashmore, J., Haggard, M. P., & Moore, B. C. J. (2002). *New developments in hearing and balance*. Oxford, UK: Oxford University Press for the British Council.

Backenroth, G. (1986). Counselling with the psycho-socially isolated deaf. *International Journal for the Advancement of Counselling, 9*(2), 125-131.

Barker, D. H., Quittner, A. L., Fink, N. E., Eisenberg, L. S., Tobey, E. A., & Niparko, J. K. (2009). Predicting behavior problems in deaf and hearing children: The influences of language, attention, and parent–child communication. *Development and Psychopathology, 21*(02), 373-392.

Barton, G. R., Fortnum, H. M., Stacey, P. C., & Summerfield, A. Q. (2006). Hearing-impaired children in the United Kingdom, III: Cochlear implantation and the economic costs incurred by families. *Ear and Hearing, 27*(5), 563-574.

Beadle, E. A. R., McKinley, D. J., Nikolopoulos, T. P., Brough, J., O'Donoghue, G. M., & Archbold, S. M. (2005). Long-term functional outcomes and

academic-occupational status in implanted children after 10 to 14 years of cochlear implant use. *Otology and Neurotology, 26*(6), 1152-1160.

Belal, A. (1986). Cochlear implantation in developing countries. *The American Journal of Otology, 7*(4), 244-247.

Bittencourt, Z. Z. L. d. C., Francozo, M. d. F. d. C., Monteiro, C. R., & Francisco, D. D. (2011). Deafness, social network and social protection. *Ciencia & Saude Coletiva, 16*(Supplement 1), 769-776.

Black, J., Hickson, L., & Black, B. (2012). Defining and evaluating success in paediatric cochlear implantation - An exploratory study. *International Journal of Pediatric Otorhinolaryngology, 76*(9), 1317-1326.

Black-Hawkins, K. (2010). The Framework for Participation: a research tool for exploring the relationship between achievement and inclusion in schools. *International Journal of Research & Method in Education, 33*(1), 21-40.

Boons, T., Brokx, J. P. L., Dhooge, I., Frijns, J. H. M., Peeraer, L., Vermeulen, A, & ...van Wieringen, A. (2012). Predictors of spoken language development following pediatric cochlear implantation. *Ear and Hearing, 33*(5), 629-639.

Bostees, S., Van Hove, G., & Vandenbroeck, M. (2012). The roller-coaster of experiences: becoming the parent of a deaf child. *Disability & Society, 27*(7), 983-996.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

British Cochlear Implant Group-BCIG (2015). *Cochlear implant*. Retrieved 2015-11-18 from www.bcig.org.uk.

Brocki, J. M., & Wearden, A. J. (2006). A critical evaluation of the use of interpretative phenomenological analysis (IPA) in health psychology. *Psychology & Health, 21*(1), 87-108.

Bryman, A. (2012). Social research methods. Oxford university press.

Bryman, A., Becker, S., & Sempik, J. (2008). Quality criteria for quantitative, qualitative and mixed methods research: A view from social policy. *International Journal of Social Research Methodology, 11*(4), 261-276.

Burkey J. M. (2006). *Baby boomers and hearing loss: A guide to prevention and care*. New Brunswick, NJ: Rutgers University Press. Available from http://site.ebrary.com/lib/york/Doc?id=10153086

Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis* (Vol. 248). London, UK: Heinemann.

Callow-Heusser, C. A. (2011). *The effects of early identification and intervention on language outcomes of children born with hearing loss*. PhD thesis, Utah State University.

Cambra, C. (2002). Acceptance of deaf students by hearing students in regular classrooms. *American Annals of the Deaf, 147*(1), 38-45.

Catts, H. W., Fey, M. E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research, 45*(6), 1142-1157.

Centre for Diseases Control and Prevention (CDC) (n.d.). *Hearing loss in children*. Retrieved 2013-03-05 from http://www.cdc.gov/ncbddd/hearingloss/

Chadha, N. K., Chadha, R., & James, A. L. (2009). Why are children deaf? *Paediatrics and Child Health, 19*(10), 441-446.

Chapman, D. A., Stampfel, C. C., Bodurtha, J. N., Dodson, K. M., Pandya, A., Lynch, K. B., & Kirby, R. S. (2011). Impact of co-occurring birth defects on the timing of newborn hearing screening and diagnosis. *American Journal of Audiology, 20*(2), 132-139.

Chasin, J., & Harris, M. (2008). The development of visual attention in deaf children in relation to mother's hearing status. *Polish Psychological Bulletin, 39*(1), 1-8.

Cheng, A. K., Rubin, H. R., Powe, N. R., Mellon, N. K., Francis, H. W., & Niparko, J. K. (2000). Cost-utility analysis of the cochlear implant in children. *Journal of the American Medical Association, 284*(7), 850-856.

Connor, C. M., Hieber, S., Arts, H. A., & Zwolan, T. A. (2000). Speech, vocabulary, and the education of children using cochlear implants: Oral or total communication? *Journal of Speech, Language, and Hearing Research, 43*(1-5), 1185-1204.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London, UK: Sage.

Dalton, D. S., Cruickshanks, K. J., Klein, B. E., Klein, R., Wiley, T. L., & Nondahl, D. M. (2003). The impact of hearing loss on quality of life in older adults. *The Gerontologist, 43*(5), 661-668.

Damen, G. W., Krabbe, P. F., Archbold, S. M., & Mylanus, E. A. (2007). Evaluation of the Parental Perspective instrument for pediatric cochlear implantation to arrive at a short version. *International Journal of Pediatric Otorhinolaryngology, 71*(3), 425-433.

Dammeyer, J. (2014). Literacy skills among deaf and hard of hearing students and students with cochlear implants in bilingual/bicultural education. *Deafness & Education International, 16*(2), 108-119.

De Raeve, L. (2010). Education and rehabilitation of deaf children with cochlear implants: a multidisciplinary task. *Cochlear Implants International, 11*(Supplement 1), 7-14.

Department for Education (DfE) (2011). *Green paper: Children and young people with special educational needs and disabilities – call for views*. London, UK: DfE. Retrieved 2012-04-25 from http://www.education.gov.uk/consultations/

Department for Education and Skills (2001). *Special educational needs code of practice*. London, UK: DfES.

Devlieger, P. (2005). *Generating a cultural model of disability*. Presented at the 19th Congress of the European Federation of Associations of Teachers of the Deaf (FEAPDA), October 14-16, 2005.

Dockrell, J., & Messer, D. (1999). *Children's language and communication difficulties: Understanding, identification and intervention*. London, UK: Cassell.

Doherty, M. T. (2011). Inclusion and deaf education: The perceptions and experiences of young deaf people in Northern Ireland and Sweden. *International Journal of Inclusive Education, 16*(8), 791-807.

Duarte, I., Santos, C. C., Freitas, A., Rego, G., & Nunes, R. (2015). Ethics, equity, and human dignity in access to health services: The case of cochlear implants in children and adolescents. *European Archives of Oto-Rhino-Laryngology, 272*(4), 1011-1019.

Edwards, S. D. (2005). *Disability: Definitions, value and identity*. Oxford, UK: Radcliffe.

Eisenberg, L. S. (2015). The contributions of William F. House to the field of implantable auditory devices. *Hearing Research, 322,* 52-56.

Emmett, S. D., Tucci, D. L., Smith, M., Macharia, I. M., Ndegwa, S. N., Nakku, D., & ...Saunders, J. E. (2015). GDP matters: Cost effectiveness of cochlear implantation and deaf education in Sub-Saharan Africa. *Otology and Neurotology, 36*(8), 1357-1365.

Epley, P. H., Summers, J. A., & Turnbull, A. P. (2011). Family outcomes of early intervention: Families' perceptions of need, services, and outcomes. *Journal of Early Intervention, 33*(3), 201-219.

Fahmy, M. S. (2011). On the supposed moral harm of selecting for deafness. *Bioethics, 25*(3), 128-136.

Farrell, P. (2001). Special education in the last twenty years: Have things really got better? *British Journal of Special Education, 28*(1), 3-9.

Farrell, P., Dyson, A., Polat, F., Hutcheson, G., & Gallannaugh, F. (2007). The relationship between inclusion and academic achievement in English mainstream schools. *School Effectiveness and School Improvement, 18*(3), 335-352.

Fitzpatrick, E. M., & Olds, J. (2015). Practitioners' perspectives on the functioning of school-age children with cochlear implants. *Cochlear Implants International, 16*(1), 9-23.

Florian, L. (2014). What counts as evidence of inclusive education? *European Journal of Special Needs Education, 29*(3), 286-294.

Frederickson, N. & Cline, T. (2002). *Special educational needs, inclusion, and diversity: A textbook*. Buckingham, UK: Open University Press.

Froude, J. (2003). *Making sense in sign: a lifeline for a deaf child*. Clevedon, UK: Multilingual Matters.

Fuchs, P., Palmer, A. R., Rees, A., & Plack, C. J. (2010). *The Oxford handbook of auditory science*. Oxford: Oxford University Press.

Geers, A. E. (2006). Factors influencing spoken language outcomes in children following early cochlear implantation. In A. R. Møller (Ed.) *Cochlear and brainstem implants*. Basel, Switzerland: Karger.

Geers, A. E., & Brenner, C. (2003). Background and educational characteristics of prelingually deaf children implanted by five years of age. *Ear and Hearing,*

24(Supplement 1), 2S-14S.

Geers, A. E., Moog, J. S., Biedenstein, J., Brenner, C., & Hayes, H. (2009). Spoken language scores of children using cochlear implants compared to hearing age-mates at school entry. *Journal of Deaf Studies and Deaf Education, 14*(3), 371-385.

Geers, A., Tobey, E., Moog, J., & Brenner, C. (2008). Long-term outcomes of cochlear implantation in the preschool years: From elementary grades to high school. *International Journal of Audiology, 47*(Supplement 2), S21-S30.

Gordon, K. A., Tanaka, S., Wong, D. D. E., Stockley, T., Ramsden, J. D., Brown, T., & …Papsin, B. (2011). Multiple effects of childhood deafness on cortical activity in children receiving bilateral cochlear implants simultaneously. *Clinical Neurophysiology, 122*(4), 823-833.

Govaerts, P. J., De Beukelaer, C., Daemers, K., De Ceulaer, G., Yperman, M., Somers, T., ...Offeciers, F. E. (2002). Outcome of cochlear implantation at different ages from 0 to 6 years. *Otology & Neurotology, 23*(6), 885-890.

Graham, J. M., Baguley, D., & Ballantyne, J. C. (2009). *Ballantyne's deafness* (7th ed.). Hoboken, NJ: John Wiley & Sons.

Grosjean, F. (2010). Bilingualism, biculturalism, and deafness. *International Journal of Bilingual Education and Bilingualism, 13*(2), 133-145.

Guillemin, M., & Gillam, L. (2006). Attitudes to genetic testing for deafness: The importance of informed choice. *Journal of Genetic Counseling, 15*(1), 51-59.

Guthmann, D., & Graham, V. (2004). Substance abuse: A hidden problem within the D/deaf and hard of hearing communities. *Journal of Teaching in the Addictions, 3*(1), 49-64.

Hammersley, M. (2007). The issue of quality in qualitative research. *International Journal of Research & Method in Education, 30*(3), 287-305.

Harris, J. (2000). Is there a coherent social conception of disability? *Journal of Medical Ethics, 26*(2), 95-100.

Harris, M., & Chasin, J. (2005). Visual attention in deaf and hearing infants: The role of auditory cues. *The Journal of Child Psychology and Psychiatry, 46*(10), 1116-1123.

Harter, S. (1992). The relationship between perceived competence, affect, and motivational orientation within the classroom: Processes and patterns of change. *Achievement and Motivation: A Social-developmental Perspective, 2*, 77-114.

Hearing Link (2011). *How the ear works.* Retrieved 2015-06-12 from http://hearinglink.org/how-the-ear-works

Hearing Loss Association of America-HLAA (2005). *Hearing loss basics – types, causes and treatment*. Retrieved in 2013-02-18 from http://www.hearingloss.org/content/types-causes-and-treatment

Heine, C., & Browning, C. J. (2002). Communication and psychosocial consequences of sensory loss in older adults: Overview and rehabilitation directions. *Disability & Rehabilitation, 24*(15), 763-773.

Hilgenberg, A. M. D. S., Cardoso, C. C., Caldas, F. F., Tschiedel, R. D. S., Deperon, T. M., & Bahmad, F., Jr. (2015). Hearing rehabilitation in cerebral palsy: Development of language and hearing after cochlear implantation. *Brazilian Journal of Otorhinolaryngology, 81*(3), 240-247.

Hill-Briggs, F., Dial, J. G., Morere, D. A., & Joyce, A. (2007). Neuropsychological assessment of persons with physical disability, visual impairment or blindness, and hearing impairment or deafness. *Archives of Clinical Neuropsychology, 22*(3), 389-404.

Hindley, P., & Kitson, N. (2000). *Mental health and deafness*. London, UK: Whurr.

Hintermair, M. (2013). Executive functions and behavioral problems in deaf and hard-of-hearing students at general and special schools. *Journal of Deaf Studies and Deaf Education, 18*, 344-359.

Hocutt, A. M. (1996). Effectiveness of special education: Is placement the critical factor? *The Future of Children, 6*(1), 77-102.

Hornby, G. (2012). Inclusive education for children with special education needs: A critique of policy and practice in New Zealand. *Journal of International and Comparative Education, 1*(1), 52-60.

Hornby, G., & Kidd, R. (2001). Inclusion and the transition: Transfer from special to mainstream-ten years later. *British Journal of Special Education, 28*(1), 10-17.

How Stuff Works (1998). *How hearing works.* Retrieved 2013-02-18 from http://science.howstuffworks.com/life/human-biology/hearing1.htm

Hsu, T. C. (2005). Research methods and data analysis procedures used by educational researchers. *International Journal of Research & Method in Education, 28*(2), 109-133.

Huber, M., Wolfgang, H., & Klaus, A. (2008). Education and training of young people who grew up with cochlear implants. *International Journal of Pediatric Otorhinolaryngology, 72*(9), 1393-1403.

Hudspeth, A. J. (2005). How the ear's works work: Mechanoelectrical transduction and amplification by hair cells. *Comptes Rendus Biologies, 328*(2), 155-162.

Huttunen, K., Rimmanen, S., Vikman, S., Virokannas, N., Sorri, M., Archbold, S., & Lutman, M. E. (2009). Parents' views on the quality of life of their children 2–3 years after cochlear implantation. *International Journal of Pediatric Otorhinolaryngology, 73*(12), 1786-1794.

Hyde, M., Punch, R., & Grimbeek, P. (2011). Factors predicting functional outcomes of cochlear implants in children. *Cochlear Implants International, 12*(2), 94-104.

Individuals with Disabilities Education Act (IDEA) (2004). *IDEA reauthorization*. US: Congressional Digest.

Jackson, C. W., & Turnbull, A. (2004). Impact of deafness on family life: A review of the literature. *Topics in Early Childhood Special Education, 24*(1), 15-29.

James, D., Rajput, K., Brown, T., Sirimanna, T., Brinton, J., & Goswami, U. (2005).

Phonological awareness in deaf children who use cochlear implants. *Journal of Speech, Language, and Hearing Research, 48*(6), 1511-1528.

Jones, B. (1995). *The oppression of deaf people and the place of the hearing counsellor with deaf clients*. Master's dissertation, University of Nottingham, Nottingham.

Kaiser, A. P., & Roberts, M. Y. (2011). Advances in early communication and language intervention. *Journal of Early Intervention, 33*(4), 298-309.

Kermit, P. (2009). Deaf or deaf? Questioning alleged antinomies in the bioethical discourses on cochlear implantation and suggesting an alternative approach to d/Deafness. *Scandinavian Journal of Disability Research, 11*(2), 159-174.

Khandekar, R., Khabori, M., Jaffer Mohammed, A., & Gupta, R. (2006). Neonatal screening for hearing impairment--The Oman experience. *International Journal of Pediatric Otorhinolaryngology, 70*(4), 663-670.

Kim, L.-S., Jeong, S.-W., Lee, Y.-M., & Kim, J.-S. (2010). Cochlear implantation in children. *Auris Nasus Larynx, 37*(1), 6-17.

King Saud University-Research Chair for Hearing Disability-RCHD (n.d.). Cochlear Implantation. Retrieved 2012-06-09 from http://ksu.edu.sa/sites/KSUArabic/Mngmnt/RectorAndDeputies/UDB/RCHD/Pages/default.aspx

Korres, S. G., Balatsouras, D. G., Nikolopoulos, T., Korres, G. S., & Ferekidis, E. (2006). Making universal newborn hearing screening a success. *International Journal of Pediatric Otorhinolaryngology, 70*(2), 241-246.

Kramer, S. E., Kapteyn, T. S., Kuik, D. J., & Deeg, D. J. H. (2002). The association of hearing impairment and chronic diseases with psychosocial health status in older age. *Journal of Aging and Health, 14*(1), 122-137.

Kunisue, K., Fukushima, K., Nagayasu, R., Kawasaki, A., & Nishizaki, K. (2006). Longitudinal formant analysis after cochlear implantation in school-aged children. *International Journal of Pediatric Otorhinolaryngology, 70*(12), 2033-2042.

Kushalnagar, P., Krull, K., Hannay, J., Mehta, P., Caudle, S., & Oghalai, J. (2007). Intelligence, parental depression, and behavior adaptability in deaf children being considered for cochlear implantation. *Journal of Deaf Studies and Deaf Education, 12*(3), 335-349.

Kyriacou, C. (2009). *Effective teaching skills: theory and practice* (3rd ed.). Cheltenham, UK: Nelson Thornes.

Kyriacou, C. (2014). *Factor analysis workshop*. York, UK: University of York.

Ladd, P. (2003). *Understanding deaf culture: In search of deafhood*. Clevedon, UK: Multilingual Matters.

Lane, H. L. (2002). Do deaf people have a disability? *Sign Language Studies, 2*(4), 356-379.

Levy-Shiff, R., & Hoffman, M. A. (1985). Social behaviour of hearing-impaired and

normally-hearing preschoolers. *British Journal of Educational Psychology, 55*(2), 111-118.

Li, Y., Bain, L., & Steinberg, A. G. (2004). Parental decision-making in considering cochlear implant technology for a deaf child. *International Journal of Pediatric Otorhinolaryngology, 68*(8), 1027-1038.

Limb, C. J., Francis, H. W., Archbold, S., O'Donoghue, G., & Niparko, J. K. (2010). Cochlear implants: Results, outcomes, rehabilitation, and education. In M. A. Richardson, P. W. Flint, B. H. Haughey, V. J. Lund, J. K. Niparko, K. T. Robbins, J. R. Thomas, & M. M. Lesperance (Eds.) *Cummings Otolaryngology - Head and Neck Surgery* (5th ed.) (2243-2257). Philadelphia, PA: Mosby Elsevier.

Lindqvist, G., Nilholm, C., Almqvist, L., & Wetso, G.-M. (2011). Different agendas? The views of different occupational groups on special needs education. *European Journal of Special Needs Education, 26*(2), 143-157.

Lindsay, G. (2003). Inclusive education: a critical perspective. *British Journal of Special Education, 30*(1), 3-12.

Lindsay, G. (2007). Educational psychology and the effectiveness of inclusive education/mainstreaming. *British Journal of Educational Psychology, 77*(1), 1-24.

Liu, S., & Raver, S. A. (2011). The emergence of early intervention for children with hearing loss in China. *Journal of the International Association of Special Education, 12*(1), 59-64.

Loebach, J. L., Pisoni, D. B., & Svirsky, M. A. (2010). Effects of semantic context and feedback on perceptual learning of speech processed through an acoustic simulation of a cochlear implant. *Journal of Experimental Psychology: Human Perception and Performance, 36*(1), 224-234.

Lovett, R. E. S., Vickers, D. A., & Summerfield, A. Q. (2015). Bilateral cochlear implantation for hearing-impaired children: Criterion of candidacy derived from an observational study. *Ear and Hearing, 36*(1), 14-23.

Lustig, L. R., & Wackym, P. A. (2005). Bilateral cochlear implantation. *Operative Techniques in Otolaryngology-Head and Neck Surgery, 16*(2), 125-130.

MacArdle, B., & Bitner-Glindzicz, M. (2010). Investigation of the child with permanent hearing impairment. *Archives of Disease in Childhood-Education & Practice Edition, 95*(1), 14-23.

Marschark, M. (2003). Interactions of language and cognition in deaf learners: from research to practice. *International Journal of Audiology, 42*(2), S41-S48.

Marschark, M., & Knoors, H. (2012). Educating deaf children: language, cognition, and learning. *Deafness and Education International, 14*(3), 136-160.

Marschark, M., Sarchet, T., Rhoten, C., & Zupan, M. (2010). Will cochlear implants close the reading achievement gap for deaf students? In M. Marschark P. E. Spencer (Eds.) T*he Oxford Handbook of Deaf Studies, Language, and Education* (Vol. 2) (127-143). Oxford, UK: Oxford University Press.

Martin, D., Bat-Chava, Y., Lalwani, A., & Waltzman, S. B. (2010). Peer relationships of deaf children with cochlear implants: Predictors of peer entry and peer interaction success. *Journal of Deaf Studies and Deaf Education, 16*(1), 108-120.

Mauk, G. W., White, K. R., Mortensen, L. B., & Behrens, T. R. (1991). The effectiveness of screening programs based on high-risk characteristics in early identification of hearing impairment. *Ear and hearing, 12*(5), 312-319.

Maxwell-McCaw, D., & Zea, M. C. (2011). The deaf acculturation scale (DAS): Development and validation of a 58-item measure. *Journal of Deaf Studies and Deaf Education, 16*(3), 325-342.

May-Mederake, B., Kuehn, H., Vogel, A., Keilmann, A., Bohnert, A., Mueller, S., & ...Coninx, F. (2010). Evaluation of auditory development in infants and toddlers who received cochlear implants under the age of 24 months with the LittlEARS® Auditory Questionnaire. *International Journal of Pediatric Otorhinolaryngology, 74*(10), 1149-1155.

McConnell, B. (2005). More than meets the eye. *Broadcasting & Cable, 135*(23), 12.

McNeill, C., Noble, W., Purdy, S. C., O'Brien, A., & Sharma, M. (2012). Bilateral cochlear implants in long-term and short-term deafness. *Cochlear Implants International, 13*(1), 50-53.

Meinzen-Derr, J., Wiley, S., Grether, S., & Choo, D. I. (2011). Children with cochlear implants and developmental disabilities: A language skills study with developmentally matched hearing peers. *Research in Developmental Disabilities, 32*(2), 757-767.

Messiou, K. (2011). Collaborating with children in exploring marginalization: An approach to inclusive education. *International Journal of Inclusive Education, 16*(12), 1311-1322.

Miller, K. (2008). Closing a resource room for students who are deaf or hard of hearing. *Communication Disorders Quarterly, 29*(4), 211-218.

Ministry of Education (2010). *The regulations of the institutes and special education programs.* Retrieved 2012-03-15 from http://www.se.gov.sa/rules/se_rules/index.htm

Ministry of Education (n.d.) *Special education database*. Retrieved 2012-07-11 from http://www.gsse.org/e.2aboutus.htm

Ministry of Foreign Affairs for Saudi Arabia (2012). *About the Kingdom*. Retrieved 2012-05-10 from http://www.mofa.gov.sa/aboutKingDom/Pages/KingdomGeography37.aspx

Ministry of National Guard (2014) *Cochlear implant program*. Retrieved 2015-05-11 from http://ngha.med.sa/Arabic/MedicalCities/AlRiyadh/CIP/Pages/UNBHSP.aspx

Mishra, A., & Franck, K. H. (2008). Pediatric cochlear implantation - II: Postoperative follow-up. *Indian Journal of Otolaryngology and Head and Neck Surgery, 60*(2), 106-111.

Mittler, P. (2012). *Working towards inclusive education: Social contexts*: London, UK: David Fulton.

Møller, A. R. (2006). *Cochlear and brainstem implants* (Vol. 64). Basel: Switzerland: Karger.

Morton, N. E. (1991). Genetic epidemiology of hearing impairment. *Annals of the New York Academy of Sciences, 630*(1), 16-31.

Muijs, D., & Reynolds, D. (2010). *Effective teaching: Evidence and practice*. London, UK: Sage.

Munoz-Baell, I. M., Alvarez-Dardet, C., Ruiz-Cantero, M., Ferreiro-Lago, E., & Aroca-Fernandez, E. (2011). Understanding deaf bilingual education from the inside: A SWOT analysis. *International Journal of Inclusive Education, 15*(9), 865-889.

Murphy, J., Summerfield, A. Q., O'Donoghue, G. M., & Moore, D. R. (2011). Spatial hearing of normally hearing and cochlear implanted children. *International Journal of Pediatric Otorhinolaryngology, 75*(4), 489-494.

Nance, W. E. (2003). The genetics of deafness. *Mental Retardation and Developmental Disabilities Research Reviews, 9*(2), 109-119.

Nash, P., Schlösser, A., & Scarr, T. (2015). Teachers' perceptions of disruptive behaviour in schools: A psychological perspective. *Emotional and Behavioural Difficulties*, 1-14.

Nash, P., Stengelhofen, J., Brown, J., & Toombs, L. (2002). *Improving children's communication, managing persistent difficulties*. London, UK: Whurr.

National Dissemination Center for Children with Disabilities (2010). *Deafness and hearing loss*. NICHCY Disability Fact Sheet 3 (FS3). Retrieved 2013-01-07 from http://www.hearingloss.org/content/cochlear-implants

National Dissemination Center for Children with Disabilities (NICHCY) (2010). *Deafness and hearing loss*. Washington. Retrieved 2012-05-11 from http://nichcy.org/disability/specific/hearingloss#wrap

National Health Service (NHS) (n.d.). *Hearing loss*. Retrieved 2015-10-24 from http://www.nhs.uk/conditions/Hearing-impairment/Pages/Introduction.aspx

Navarro Sada, A., & Maldonado, A. (2007). Research methods in education. Sixth edition - by Louis Cohen, Lawrence Manion and Keith Morrison. *British Journal of Educational Studies, 55*(4), 469-470.

Nicholas, J. G., & Geers, A. E. (2003). Personal, social, and family adjustment in school-aged children with a cochlear implant. *Ear and Hearing, 24*(1), 69S-81S.

Nikolopoulos, T. P., Archbold, S. M., & Gregory, S. (2005). Young deaf children with hearing aids or cochlear implants: Early assessment package for monitoring progress. *International Journal of Pediatric Otorhinolaryngology, 69*(2), 175-186.

Nikolopoulos, T. P., Archbold, S. M., & O'Donoghue, G. M. (1999). The development of auditory perception in children following cochlear implantation. *International Journal of Pediatric Otorhinolaryngology, 49*(Supplement 1), S189-S191.

Nikolopoulos, T. P., Archbold, S. M., Wever, C. C., & Lloyd, H. (2008). Speech production in deaf implanted children with additional disabilities and comparison with age-equivalent implanted children without such disorders. *International Journal of Pediatric Otorhinolaryngology, 72*(12), 1823-1828.

Nikolopoulos, T. P., Gibbin, K. P., & Dyar, D. (2004). Predicting speech perception outcomes following cochlear implantation using Nottingham children's implant profile (NChIP). *International Journal of Pediatric Otorhinolaryngology, 68*(2), 137-141.

Nikolopoulos, T. P., Lloyd, H., Archbold, S., & O'Donoghue, G. M. (2001). Pediatric cochlear implantation: The parents' perspective. *Archives of Otolaryngology–Head & Neck Surgery*, *127*(4), 363-367.

Noble, H. (2010). Improving the experience of deaf students in higher education. *British Journal of Nursing, 19*(13), 851-854.

Norwich, B. (2007). *Dilemmas of difference, inclusion and disability: International perspectives and future directions*. London, UK: Routledge.

O'Brien, L. C. G., Kenna, M., Neault, M., Clark, T. A., Kammerer, B., Johnston, J., & …Licameli, G. R. (2010). Not a "sound" decision: Is cochlear implantation always the best choice? *International Journal of Pediatric Otorhinolaryngology, 74*(10), 1144-1148.

O'Neill, C., Lutman, M. E., Archbold, S. M., Gregory, S., & Nikolopoulos, T. P. (2004). Parents and their cochlear implanted child: Questionnaire development to assess parental views and experiences. *International Journal of Pediatric Otorhinolaryngology, 68*(2), 149-160.

Oliver, J. (2013). New expectations: Pediatric cochlear implantation in Japan. *Cochlear Implants International, 14*(Supplement 1), S13-S17.

Olusanya, B. O. (2006). Early hearing detection and intervention in developing countries: Current status and prospects. *The Volta Review, 106*(3), 381-418.

Onwuegbuzie, A. J., & Leech, N. L. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology, 8*(5), 375-387.

Park, J., Hoffman, L., Marquis, J., Turnbull, A. P., Poston, D., & Mannan, H. (2003). Toward assessing family outcomes of service delivery: Validation of a family quality of life survey. *Journal of Intellectual Disability Research, 47*(4/5), 367-384.

Percy-Smith, L., Cayé-Thomasen, P., Gudman, M., Jensen, J. H., & Thomsen, J. (2008). Self-esteem and social well-being of children with cochlear implant compared to normal-hearing children. *International Journal of Pediatric Otorhinolaryngology, 72*(7), 1113-1120.

Pisoni, D. B., Conway, C. M., Kronenberger, W. G., Horn, D. L., Karpicke, J., & Henning, S. C. (2008). Efficacy and effectiveness of cochlear implants in deaf children. In M. Marschark & P. C. Hauser (Eds.) D*eaf cognition: Foundations and outcomes* (52-101). Oxford, UK: Oxford University Press.

Plowright, D. (2013). To what extent do postgraduate students understand the principles of mixed methods in educational research? *International Journal of Multiple Research Approaches, 7*(1), 66-82.

Pring, R. (2005). *Philosophy of education: Aims, theory, common sense and research*. London, UK: Continuum.

Punch, R., & Hyde, M. (2011). Social participation of children and adolescents with cochlear implants: A qualitative analysis of parent, teacher, and child interviews. *Journal of Deaf Studies and Deaf Education, 16*(4), 474-493.

Quittner, A. L., Leibach, P., & Marciel, K. (2004). The impact of cochlear implants on young deaf children: New methods to assess cognitive and behavioral development. *Archives of Otolaryngology–Head & Neck Surgery, 130*(5), 547-554.

Ramsden, J. D., Papaioannou, V., Gordon, K. A., James, A. L., & Papsin, B. C. (2009). Parental and program's decision making in paediatric simultaneous bilateral cochlear implantation: Who says no and why? *International Journal of Pediatric Otorhinolaryngology, 73*(10), 1325-1328.

Rée, J. (1999). *I see a voice: Deafness, language and the senses - a philosophical history*. New York, NY: Henry Holt and Company.

Rembar, S., Lind, O., Arnesen, H., & Helvik, A.-S. (2009). Effects of cochlear implants: A qualitative study. *Cochlear Implants International, 10*(4), 179-197.

Richter, B., Eißele, S., Laszig, R., & Löhle, E. (2002). Receptive and expressive language skills of 106 children with a minimum of 2 years' experience in hearing with a cochlear implant. *International Journal of Pediatric Otorhinolaryngology, 64*(2), 111-125.

RNID (2002). *Inclusion: What deaf pupils think?* London, UK: The Royal National Institute for Deaf People (University of Hertfordshire).

Ronnberg, J. (2003). Cognition in the hearing impaired and deaf as a bridge between signal and dialogue: A framework and a model. *International Journal of Audiology, 42*(2), S68-S70.

Roots, J. (1999). *The politics of visual language deafness, language choice, and political socialization*. Ottawa, ON: Carleton University Press.

Ryan, J. B., Katsiyannis, A., Peterson, R., & Chmelar, R. (2007). IDEA 2004 and disciplining students with disabilities. *NASSP Bulletin, 91*(2), 130-140.

Sach, T. H., Whynes, D. K., Archbold, S. M., & O'Donoghue, G. M. (2005). Estimating time and out-of-pocket costs incurred by families attending a pediatric cochlear implant programme. *International Journal of Pediatric Otorhinolaryngology, 69*(7), 929-936.

Salvia, J., Ysseldyke, J., & Bolt, S. (2012). *Assessment: In special and inclusive education*. Belmont, CA: Cengage Learning.

Sanders, R. D. (2010). The trigeminal (V) and facial (VII) cranial nerves: Head and face sensation and movement. *Psychiatry (Edgmont), 7*(1), 13-16.

Sataeva, A. I. (2015). Pedagogical rehabilitation of deaf pre-school children following cochlear implantation. *Vestnik otorinolaringologii, 80*(1), 28-31.

Scherf, F. W., van Deun, L., van Wieringen, A., Wouters, J., Desloovere, C., Dhooge, I., & …Van de Heyning, P. H. (2009). Functional outcome of sequential bilateral cochlear implantation in young children: 36 months postoperative results. *International Journal of Pediatric Otorhinolaryngology, 73*(5), 723-730.

Schick, B. S., Marschark, M., & Spencer, P. E. (2006). *Advances in the sign language development of deaf children*. Oxford, UK: Oxford University Press.

Scott, D. (2007). Resolving the quantitative–qualitative dilemma: A critical realist approach. *International Journal of Research & Method in Education, 30*(1), 3-17.

SENCo-Forum (2004). The practicalities of inclusion. *British Journal of Special Education, 31*(1), 50.

Senghas, R., & Monaghan, L. (2002). Sign of their times: Deaf communities and the culture of language. *Annual Review of Anthropology, 31*, 69-97.

Sensini, I. (1987). Deafness today: Causes, prophylaxis, and prevention. *Effeta, 80*(11-12), 238-241.

Shah, S. (2007). Special or mainstream? The views of disabled students. *Research Papers in Education, 22*(4), 425-442.

Sheridan, M. (2001). *Inner lives of deaf children: Interviews and analysis*. Washington, DC: Gallaudet University Press.

Skelton, T., & Valentine, G. (2003). 'It feels like being deaf is normal': An exploration into the complexities of defining D/deafness and young D/deaf people's identities. *The Canadian Geographer, 47*(4), 451-466.

Sparreboom, M., Langereis, M. C., Snik, A. F. M., & Mylanus, E. A. M. (2015). Long-term outcomes on spatial hearing, speech recognition and receptive vocabulary after sequential bilateral cochlear implantation in children. *Research in Developmental Disabilities, 36*, 328-337.

Sparreboom, M., Leeuw, A. R., Snik, A. F. M., & Mylanus, E. A. M. (2012). Sequential bilateral cochlear implantation in children: Parents' Perspective and device use. *International Journal of Pediatric Otorhinolaryngology, 76*(3), 339-344.

Spencer, L. J., Gantz, B. J., & Knutson, J. F. (2004). Outcomes and achievement of students who grew up with access to cochlear implants. *The Laryngoscope, 114*(9), 1576-1581.

Spencer, P. E., & Marschark, M. (2006). *Advances in the spoken language development of deaf and hard-of-hearing children*. Oxford, UK: Oxford University Press.

Spratt, J., & Florian, L. (2015). Inclusive pedagogy: From learning to action. Supporting each individual in the context of 'everybody'. *Teaching and Teacher Education, 49*, 89-96.

Stacey, P. C., Fortnum, H. M., Barton, G. R., & Summerfield, A. Q. (2006). Hearing-impaired children in the United Kingdom, I: Auditory performance, communication skills, educational achievements, quality of life, and cochlear implantation. *Ear and Hearing, 27*(2), 161-186.

Steinberg, A., Brainsky, A., Bain, L., Montoya, L., Indenbaum, M., & Potsic, W. (2000). Parental values in the decision about cochlear implantation. *International Journal of Pediatric Otorhinolaryngology, 55*(2), 99-107.

Stinson, M., & Antia, S. (1999). Considerations in educating deaf and hard-of-hearing students in inclusive settings. *Journal of Deaf Studies and Deaf Education, 4*(3), 163-175.

Stinson, M. (1978). Effects of deafness on maternal expectations about child development. *The Journal of Special Education, 12*(1), 75-81.

Stinson, M. S., Elliot, L. B., Kelly, R. R., & Liu, Y. (2009). Deaf and hard-of-hearing students' memory of lectures with speech-to-text and interpreting/note taking services. *The Journal of Special Education, 43*(1), 52-64.

Swanwick, R., & Marschark, M (2010). Enhancing education for deaf children: research into practice and back again. *Deafness and Education International, 12*(4), 217-235.

Symonds, J. E., & Gorard, S. (2010). Death of mixed methods? Or the rebirth of research as a craft. *Evaluation & Research in Education, 23*(2), 121-136.

Tait, M., Nikolopoulos, T. P., De Raeve, L., Johnson, S., Datta, G., Karltorp, E., & …Frijns, J. H. (2010). Bilateral versus unilateral cochlear implantation in young children. *International Journal of Pediatric Otorhinolaryngology, 74*(2), 206-211.

Thyer, B. A. (2010). *The handbook of social work research methods.* Thousand Oaks, CA: Sage.

United Nations Children's Fund (UNICEF) (2010). *Regional conference of the direction of violence to children in the region: Middle East*. New York, NY: United Nations. Retrieved 2012-06-18 from http://www.unicef.org/arabic/progressforchildren/files/Progress_for_Children_Ar.doc

UNESCO (1994). *Final report – The Salamanca world conference on special needs education: Access and quality*. Paris: UNESCO.

US National Library of Medicine (2014). *Cochlear implant.* Retrieved 2015-08-10 from https://www.nlm.nih.gov/medlineplus/ency/article/007203.htm

Vaccari, C., & Marschark, M. (1997). Communication between parents and deaf children: Implications for social-emotional development. *Journal of Child Psychology and Psychiatry, 38*(7), 793-801.

Van Gent, T., Goedhart, A. W., & Treffers, P. D. (2011). Self-concept and psychopathology in deaf adolescents: Preliminary support for moderating

effects of deafness-related characteristics and peer problems. *Journal of Child Psychology and Psychiatry, 52*(6), 720-728.

van Wieringen, A., & Wouters, J. (2015). What can we expect of normally-developing children implanted at a young age with respect to their auditory, linguistic and cognitive skills? *Hearing Research, 322*, 171-179.

Vlahović, S., & Šindija, B. (2004). The influence of potentially limiting factors on paediatric outcomes following cochlear implantation. *International Journal of Pediatric Otorhinolaryngology, 68*(9), 1167-1174.

Vlastarakos, P. V., Proikas, K., Papacharalampous, G., Exadaktylou, I., Mochloulis, G., & Nikolopoulos, T. P. (2010). Cochlear implantation under the first year of age—The outcomes. A critical systematic review and meta-analysis. *International Journal of Pediatric Otorhinolaryngology, 74*(2), 119-126.

Warner-Czyz, A. D., Loy, B., Roland, P. S., Tong, L., & Tobey, E. A. (2009). Parent versus child assessment of quality of life in children using cochlear implants. *International Journal of Pediatric Otorhinolaryngology, 73*(10), 1423-1429.

Warnock, M., & Norwich, B. (2010). *Special educational needs: A new look*. London, UK: Continuum.

Watson, L. R., Powers, S., & Gregory, S. (1999). *Deaf and hearing impaired pupils in mainstream schools*. London, UK: David Fulton.

Weber, A. S., & City, E. (2012). Inclusive education in the Gulf Cooperation Council. *Journal of Educational and Instructional Studies in the World, 2*(2), 85-97.

Wellington, J. (2000). *Educational research: Contemporary issues and practical approaches*. London, UK: Continuum.

Werngren-Elgstrom, M., Dehlin, O., & Iwarsson, S. (2003). A Swedish prevalence, study of deaf people using sign language: a prerequisite for Deaf studies. *Journal of Disability and Society, 18*(3), 311-323.

Wever, C. C. (2002). *Parenting deaf children in the era of cochlear implantation: A narrative-ethical analysis*. PhD thesis, University of Nijmegen, Netherlands.

Wheeler, A., Archbold, S. M., Hardie, T., & Watson, L. M. (2009). Children with cochlear implants: The communication journey. *Cochlear Implants International, 10*(1), 41-62.

White, K. R. (2006). Early intervention for children with permanent hearing loss: Finishing the EHDI revolution. *The Volta Review, 106*(3), 237-258.

Wie, O. B. (2010). Language development in children after receiving bilateral cochlear implants between 5 and 18 months. *International Journal of Pediatric Otorhinolaryngology, 74*(11), 1258-1266.

Wilson, J. (2000). Doing justice to inclusion. *European Journal of Special Needs Education, 15*(3), 297-304.

Winter, L., Morawska, A., & Sanders, M. R. (2012). The effect of behavioral family intervention on knowledge of effective parenting strategies. *Journal of Child and Family Studies, 21*(6), 881-890.

World Health Organisation (WHO) (2015). *Deafness and hearing loss*. Fact sheet No. 300. Retrieved 2015-11-19 from http://www.who.int/mediacentre/factsheets/fs300/en/index.html

Worth, T. H., & Liyanage, S. P. (1972). A pilot survey of hearing loss in patients with rheumatoid arthritis. *Scandinavian Journal of Rheumatology, 1*(2), 81-83.

Wu, C.-M., Liu, T.-C., Liao, P.-J., Chen, C.-K., Chang, B.-L., & Lin, B.-G. (2013). Academic achievements and classroom performance in Mandarin-speaking prelingually deafened school children with cochlear implants. *International Journal of Pediatric Otorhinolaryngology, 77*(9), 1474-1480.

Young, A., Green, L., & Rogers, K. (2008). Resilience and deaf children: A literature review. *Deafness & Education International, 10*(1), 40-55.

Zaidman-Zait, A., & Most, T. (2005). Cochlear implants in children with hearing loss: maternal expectations and impact on the family. *Volta Review, 105*(2), 129-150.

Arabic sources

Alnobi (2009) الإعاقة السمعية : دليل الآباء و الأمهات و المعلمين وطلاب التربية الخاصة. عمان ، الأردن: دار وائل { Guidance of Fathers, Mothers and Students with special needs)

Naqawa (2010) فاعلية برنامج تأهيل سمعي لفظي في تحسين مهارات النطق لدى الأطفال مستخدمي جهاز زراعة القوقعة السمعية الإلكترونية في عمر ما قبل المدرسة بالمملكة العربية السعودية (رسالة دكتوراه غير منشورة). جامعة عمان العربية، عمان. مسترجع من http://search.mandumah.com/Record/636425{The effectiveness of audio/oral rehabilitation programme to improve speech skills for children with cochlear implants in Saudi Arabia}

Abdulhameed,S &Beshtawh,M (2012) فاعلية برنامج تدريبى لتنمية مهارات اللغة الاستقبالية والتعبيرية لدى ضعف السمع من مستخدمى جهاز زراعة القوقعة السمعية الإلكترونية بالمرحلة الابتدائية. دراسات عربية في التربية وعلم النفس - السعودية, 000(026). {The effectiveness of training programme to improve receptive and expressive language skills for children with cochlear implants in primary school}

Alsek (February ,2014) الوراثة اسباب الاعاقة. مجلة المنال {Genetics as causes of disability}

القضاة،حسن بحوث الخدمات الصحية مسترجع في نوفمبر 2015 من

www.kau.edu.sa/GetFile.aspx?id=224257&fn {Researches of Health Services}