A study of nutrition education in early years in England

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Abstract

The key objective of the current research was to study nutritional education in early years settings in England focusing on nutrition knowledge development. The objective was achieved by focusing on crucial components such as capturing the opinions of practitioners and management on nutrition education in the early years settings, the teaching, and learning techniques used to implement nutrition education, effects of such activities on children's learning outcomes, and assessment methods used by the staff. The data were collected in two phases using mixed methods. An online survey, interviews, nutrition knowledge test and 'Learning Journal' observations were the research methods used. The results showed that most of the practitioners mentioned parents were responsible for educating children about nutrition. Although most of them agreed early years was the correct age to start nutrition education to children, many of them limited it to making children try new foods. The nutrition-related topics suggested by the practitioners were not implemented at the settings. Managers focus was only on providing healthy diet at the settings. Practitioners mentioned there were opportunities to deal with nutrition education at the settings, but evidence could not be found on them being utilised for children's nutrition knowledge development. Evaluation of children's nutrition knowledge indicated that they have the cognitive ability to understand nutrition topics, but the source of their knowledge was not practitioners. This study concludes that early years professionals ascertain children's nutrition knowledge is important but need more support through training to enhance children's nutrition knowledge.

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Author's declaration

I hereby declare that the work contained in the thesis is my own work and have not been previously submitted or published anywhere else. I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

Chapter 1. Introduction

"If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health." — Hippocrates

1.1. Outline of the aim and purpose of the study

England's Office for Standards in Education (Ofsted), (2004), stated that "eating habits are developed from a young age and messages about healthy lifestyles need to be delivered in a clear and consistent manner if children are to develop the knowledge, understanding and skills they need to make appropriate food choices and develop positive attitudes to diet and health". This was the footing for this research to understand how much knowledge children were developing in England's early years settings regarding healthy diet. The National Institute for Health and Care Excellence (NICE) (2008) further emphasized that the preschool years are the best time to create foundations for a healthy lifestyle. Through my research study, I aim to understand the current situation in early years (as defined in definitions 3-5 years of age) with regard to nutrition education in England. Lemer (2015, p. 4) stated that health statistics in the United Kingdom (UK) showed that 12.5 percent of toddlers were obese. Lemer also mentioned there was a high chance that a high percentage of them grew into obese adults, which will not only affect the social and physical development of individuals, but also have a significant influence on the state's economy, due to increase in healthcare costs and low productivity. Recent health studies point out the need for healthy eating and lifestyle to safeguard and improve the health status of future generations. People could develop a healthy lifestyle with proper nutrition knowledge and if this nutrition knowledge was available from early years, the long-term exposure to knowledge could further aid in the development of healthy nutritional habits.

Malnourishment (Alderman, Hoddinott, & Kinsey, 2006) and faulty food habits (Kim, Kim, Kim, Lee, & Lee, 2001; Shin, Yoo, & Park, 2005) in early years will have long-term effects on children's growth and development. Malnourishment not only means lack of nutrients but also disproportionate intake of nutrients, which may be the root cause of many health conditions. Lack of proper nutrition also influences children's academic achievement levels (Glewwe, Jacoby, & King, 2001; Jukes, 2005). The effect of early feeding and food acceptance might influence habits in later stages of life (De Lauzon-Guillain et al., 2013; Skinner, Carruth, Bounds, Ziegler, & Reidy, 2002). So, development of nutrition-related knowledge in the early years could aid in the development of healthy eating habits and positive attitudes towards healthy foods. Studies have shown that early childhood interventions could be beneficial and had an influence on lifelong habits (Hu et al., 2010; Nores & Barnett, 2010). Nutrition education in early years might aid in development of healthy food habits such as eating recommended levels of fruits and vegetables (Cooke et al., 2004). Nutrition education is not only a strategy in tackling obesity (Lanigan, Barber, & Singhal, 2009; Mouratidou et al., 2012) but also can aid in improvement of other health-related matters such as oral health. Proper healthy diet knowledge could prevent dental caries a major concern in young children (S. Naidoo & Myburgh, 2007; Tinanoff, 2005; Tinanoff & Palmer, 2000). K. J. Campbell and Hesketh (2007) mentioned that the research proclaimed need for the development of evidence for the potential early interventions which could influence individual and population health. The studies reviewed in Chapter 2, the Literature Review have demonstrated the long-term and short-term benefits of nutrition education in early years. There is intervention research evidence on cognitive abilities of early years children to understand the concepts of nutrition education, but evidence

of practice is not found. So, this research was set out to evaluate the realities in early years settings to develop the nutrition knowledge and understanding.

The Advisory Panel on Food and Nutrition in Early Years (2010) mentioned that nutrition education must be more effective to tackle the faulty life style of preschool children. The education of nutrition may lead early years children to form healthy eating habits and appreciate healthy foods served to them at school age. The government of England issued an Early Years Foundation Stage (EYFS) framework that was statutory to be followed by all its early years settings from September 2008, which provides guidance on the curriculum to be followed along with other aspects such as safeguarding and welfare measures to be taken while working with children. The early learning goal as mentioned in one of the prime areas (Physical Development) is 'health and selfcare' which states-"Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe." (Department for Education (DfE), 2017a, p. 11). The importance of educating children about healthy diet was included in every version of the EYFS framework since 2008. Inclusion of this learning in all developed EYFSs could suggest that the Department of education considers early years children learning about healthy diet is important. EYFS is the mandatory framework for all the early years providers in England and the early learning goals are that children were aimed to achieve by five years old with the guidance of the practitioners(Department for Education (DfE), 2017a).Early years framework is the guidance provided by the Department of Education which should be followed by all the early years providers in England and the Ofsted inspections are based on the EYFS. There are several training courses developed by local councils and independent private bodies to provide a better understanding of the EYFS, but

these courses are not mandatory and depends on practitioners' interest. However, the Department of Education (DfE) publishes various supporting documents to provide better guidance in implementation of EYFS and DfE also maintains a website 'https://www.foundationyears.org.uk' in partnership with 'action for children' to support practitioners and families to better understand EYFS. So, the understanding of EYFS could vary from practitioner to practitioner.

The literature search conducted provided no published evidence on the state of healthy diet knowledge children are learning in early years settings in England. This study focuses on the knowledge acquiring aspect of children's nutrition education which is required to develop understanding about the importance of healthy diet and talk about healthy behaviours. EYFS guidelines and its role in nurturing children's knowledge are discussed in a section of Chapter 2 (section 2.2.3).

In this chapter's sections, along with the purpose of the study, the main objective of the research, the intended impact of the research, the research strategy, key definitions and the structure of the study are also explained.

1.2. Objectives

The key objective of this research is to study the nutrition education processes in early years and to collate practitioners' perspectives. The objective was achieved by focusing on critical components such as

- Nutrition education strategies in early years settings.
- The teaching and learning techniques used to implement the strategies.
- Effects of such activities on children's knowledge-related learning outcomes and attitudes.

- Staff assessment methods used to evaluate children's nutrition knowledge.

NICE (2008) through its literature review stated the importance of nutrition education in early years and recommended research in the area to gather evidence of the helpfulness of public intervention and policy changes. 'Practical steps to improving the quality of care and services using NICE guidance.' (NICE, 2015) developed the six practical steps based on NICE (2008) guidance, and this study could contribute to the step "Understand current ways of working" and could also aid in developing other steps such as "Make a plan", "Improve and measure". A NICE surveillance report in 2017 (14th December) confirmed need for the NICE (2008) guidelines update, but are waiting for the further evidence reports. The present research aimed to provide evidence of the state of nutrition education in early years settings in England, by gathering information about nutrition education implementation in settings, if it is provided or not, how it is done and how much knowledge is gained by children.

1.3. Definitions

- Nutrition education: one of the most accepted definitions according to FNS is

> any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviours conducive to health and well-being; . . . it is delivered through multiple venues and involves activities at the individual, community, and policy levels. (FNS, 2010, p. 3)

There were many acceptable definitions depending on which approach was adopted to promote a healthy diet. In this research, the 'nutrition education' definition adopted was

based on educational and empowerment approaches out of the five approaches to health promotion as categorised by Naidoo and Wills (2000, p.91). “The educational approach…its aim is to provide people with information and knowledge, which will enable them to make informed choices about their lifestyles and associated health.” And the empowerment approach focuses on providing control for individuals “… to have control of their own health and are enabled to make healthy choices in relation to their own lives.” (Albon & Mukherji, 2008, p. 118). The definition of nutrition education coined in this research was a combination of the two health approaches and the FNS definition.

‘Nutrition education is an amalgamation of educational approaches to facilitate understanding of nutritional information and knowledge which will enable the learner to make their own informed dietary choices’

- Early years settings: The definition provided by the Standards and Testing Agency (STA) is as following which is adopted in this research when refering to early years settings.

  All references to EYFS settings include any out-of-home provider of early years provision for children from birth to five, for example:

  - all providers registered with a childminder agency;
  - all providers on the early years register (e.g. nurseries and childminders);
  - maintained schools, non-maintained schools and independent schools with early years provision.

There are many types of early years settings operating in England. In this research ‘early years settings’ represents: Preschools, Nurseries, Day-care centres, Childminders, After-school playgroups and Reception classes attached to state-maintained primary schools.

- Early years children: The children who attend early years settings. Children from 3 to 5 years old are referred to as early years children in this research. “In September 2000, the foundation stage, for children from three years old to the end of the reception year, was introduced in England.” Association of Teachers and Lecturers (ATL) (2003, p. 7). Children who were three years old to five years were expected to achieve the learning goals (these goals are explained in detail in section 2.2.3) set in EYFS (Department for Education (DfE), 2013).

- Early Years practitioners: This term began to be used and was applied to professionals working with children in early years settings since 2007 when the government introduced Early Years Professional Status (EYPS). “Early Years Professional Status is the accreditation awarded to graduates who are leading practice from birth to the end of the Early Years Foundation Stage.” (Teaching Agency, 2012). In 2014, new qualifications rules came into implementation, and the title has changed to ‘Early Years Educator’ (EYE) (National College for Teaching & Leadership, 2013). However, in this research, the professionals working in early years settings are referred to as ‘practitioners’.

1.4. Research Approach

Baird, Mortimore, and Lucas (2013, p. 9) in their editorial article on challenges involved in implementing the British Medical Association’s (BMA) report ‘Growing up in the UK: Ensuring a Healthy Future for our Children’ stated, “Few current services and interventions for children are informed by evidence of effectiveness. The report calls for urgent action to improve the evidence base.” Therefore, through my research questions, I am gathering evidence of the current situation, which could also contribute in understanding the influence of various factors on nutrition education.

The following are the research questions formulated to study the nutritional education situation in early years settings in England.

RQ.1. How do early years providers conceive their role in nutritional education?
RQ1 was aimed at establishing early year practitioners' perspectives on nutrition education. It was also an umbrella question intended to capture information about their sources of nutrition knowledge, and their levels of confidence in delivering nutrition education. This might also aid in understanding the overall experience in delivering nutrition education such as the difficulties or constraints that practitioners face, and the influence of management on practice.

RQ.2. How much discussion about nutritional education takes place among the staff at the settings? What are the effects of such discussions?
RQ2 was to understand the background influences in the setting with regard to nutrition education and also to understand the practitioner's role in planning the activities and capturing the opportunities to deliver nutrition education.

RQ.3. What teaching and learning techniques are used to promote nutritional education? How successful are they?
RQ3 in this research aimed at understanding the teaching and learning techniques adopted by practitioners to provide nutrition education for children and the topics they consider important to be included in nutrition education. The efficiency was understood by the level of nutrition knowledge children gain from the practitioners in the settings.

RQ.4. How do providers use assessment to inform their approaches to nutrition education?

RQ4 was intended to establish if practitioners do any related recordings of observations, as recording observations is a practice in early years settings to monitor child's development. It also provided information about practitioners' thoughts on how children could be assessed for their nutrition knowledge.

These research questions were formulated based on observations of early year settings, discussed in detail in the methodology chapter (Research questions and Research plan, chapter 3), and also by literature review.

1.5. Research design

The research was conducted in two phases: first phase - online survey; second phase - semi-structured interviews, and knowledge tests for children. In the first, an online questionnaire was developed, and data were collected using social media as one of the main platforms to reach practitioners across England (further explained in chapter 4). The interview schedules for practitioners and managerial staff, and a knowledge test for children used in the second phase were developed on the basis of first phase data. A purposive sampling technique was used for second phase sample selection. Sample early years settings in Leeds and York were used for data collection (further explained in chapter 5).

The qualitative and quantitative data collected from the two phases were coded and analysed applying appropriate statistical methods. Statistical Package for the Social Sciences (SPSS), Microsoft Excel and NVivo software were used for the analysis and Tableau public as a reporting tool. Grounded theory methodology was used to develop

the discussion and draw conclusions, which is further explained in data analysis techniques (chapter 6).

1.6. Impact of research

The research was intended to build the evidence base for the actual nutrition education situation in the field. Research could help in understanding the practicalities of providing nutrition education to early years children. The study also could be documented evidence for the implementation of the EYFS framework. There were some proposed changes with regards to EYFS framework revision and children assessment in 2017, so to collect the research evidence of work done before the changes were implemented could not only aid in understanding the current situation but also could be a reference for future studies aimed at evaluating the changes. NICE (2008) also made recommendations for researchers and policy-makers to assess and recognise the right approach to increasing the nutritional knowledge of children. In the present research, the techniques used in implementation of nutrition education were studied, providing evidence of the approaches used in nutrition education. This research might act as a stepping-stone for further research aimed at developing resources to facilitate nutritional learning experiences or at the development of training opportunities for practitioners. This research also could provide the scope for future research for a broader picture of the national situation.

1.7. Structure of thesis

The chapters of thesis are explained in this section along with the chapters structural order. Table 1.1 represents the thesis structure with a list of chapters and their sections.

Chapter 2 Literature Review: The Literature Review for this research was conducted by searching various databases with a combination of terms related to early years and nutrition. This chapter has two sections. The first section focuses on understanding the need for nutrition education and why in particular early years nutrition education is important. The analysis of various learning techniques and approaches used in implementation of nutrition education and their impact on learning. Various studies are reviewed to identify the factors and their influence on providing nutrition education. The second section concentrates on the history and events which lead to policy development regarding health promotion and health education which clarifies the role of education in health promotion. Nutrition policy development in England and school nutrition policies were reviewed in this section on government guidelines about nutrition education. As the research was based on the EYFS framework, a review of the development of the framework and its key components was done.

The methodology of the research is described in 4 chapters to facilitate a better understanding of each phase of research, and the methods used in them.

Chapter 3 Research questions and Research plan: In this chapter, there are two sections: which explain the research questions development and research strategy adopted in the study.

Chapter 4 First phase-methodology: This chapter contains the sections with in-depth explanation of the development and implementation of the first phase of the study.

Chapter 5 Second Phase- methodology: The sections in this chapter are about the variables considered for purposive sample selection; development of research tools, and methods used to in data collection during the second phase.

Chapter 6 Data analysis and Sample demographics: The data analysis techniques adopted for each phase are discussed in this chapter along with analytical approach adopted in the research. The characteristics of sample population from each phase are also discussed.

Three chapters in the thesis explain the results; in each chapter the results from two phases were consolidated in accordance with the focus topics.

Chapter 7 Practitioners' and managerial staff's perspectives on nutrition education in early years settings: The views of staff are discussed in this chapter in five sections which focus on: Is responsible to teach nutrition in early years settings? What influence does EYFS have on nutrition education? At what age children should learn about nutrition? Are practitioners equipped to provide nutrition education to early years children? Are there any factors affecting practitioners to deliver nutrition education to early years children?

Chapter 8 Implementation of nutrition education: The details involved in teaching about nutrition and other related facts are discussed in this chapter as three sections: Topics of nutrition education and techniques used to implement: Staff involvement in topic preparation and implementation; Occasions and frequency.

Chapter 9 Evaluation of nutrition education: The impact of nutrition education on early years children's nutrition knowledge is discussed in two sections: Practitioners' observations; Knowledge test.

Chapter 10 Discussion and Conclusions: In this chapter, a thorough discussion of the previous chapters is given to help synthesise answers to the research questions.

The research questions are answered in this chapter and the strengths and limitations of the study are mentioned along with future research opportunities.

Appendices and references follow this chapter.

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Chapter 2. Literature review

The literature review for this research was conducted to collect research evidence about the importance of nutrition education, the learning experiences in early years setting with regard to nutrition education, the factors which influence nutrition education and also the policies and curriculum existing particularly in England as the current research was based in this country.

The basic search for the studies related to nutrition education in early years was conducted in databases and websites by using the following terms and their combinations:

Nutrition education + preschools or early years,

Healthy diet + preschools or early years,

Teaching nutrition + preschools or early years.

The databases and search engines mainly used were Google Scholar, Cochrane Library and PubMed. The research links for further review were obtained based on the citations from the basic search. The studies included in this review were those which focused on providing nutrition knowledge to children and the policies which led to providing nutrition education in educational institutes. As the emphasis in the study was on educating children about nutrition and not on nutritional effects on their physical well-being, not all the studies related to nutrition in early years were reviewed in this research study unless the emphasis of the study was on the teaching or learning experiences related to a healthy diet. The studies, which included dietary interventions without any educational aspect with the sole aim of altering the physical parametric measurements were included in a section of this chapter for the purpose of

understanding the importance of nutrition in children's development. Though these studies were important in general well-being and controlling obesity, they were not reviewed in-depth in this study as the research concentration was on the development of nutrition knowledge in children. However, the studies which reviewed applicable educational methods in improving children's acceptance of foods and those that showed behavioural change with regards to food were included in the review, to understand the techniques and atmosphere which aid the change and if the educational methods have any influence on the knowledge acquiring aspect of children's nutrition knowledge. Early years education is an interdependent developmental process where any aspect of development could not be isolated. The studies highlighted in this review were either the studies which were the first to explore the concerned point or those which were latest developments I could find in my research search.

The studies reviewed in this literature review chapter are discussed in two sections. The sections are:

2.1. Nutrition education- importance, implementation and influences: this section reviewed the studies to understand the importance of nutrition education, methods to implement it and factors which influence implementation.

2.2. Nutrition within Health Education - origin, policies and curriculum: this section is focused on explaining the origins of nutrition education, policy development and inclusion in early years curriculum.

2.1. Nutrition education- importance, implementation and influences

The section contains three sections as explained below:

- Importance of nutrition education: the studies reviewed in this section explores the need for nutrition education and also the importance of starting nutrition education in early years.
- Nutrition learning experiences: the pedagogical strategies to teach nutrition and the evidence about how efficient they are or not according to research were reviewed in this section.
- Factors affecting nutrition education: this section includes the review of studies focusing on the practicalities of implementing nutrition education in educational institutes.

2.1.1. Importance of nutrition education

Nutrition education is about providing knowledge to make informed healthy dietary choices and developing a positive attitude towards healthy food (see 1.3 Definitions). There have been many studies based on nutrition since the discovery of micronutrients and vitamins in the 19th century, however, creating awareness about the harmony between good nutrition and health was not a simple issue as food is a complex cultural object (Chamberlain, 2004). The Inequalities report by Black, Morris, and Townsend (1980) stressed the importance of improving health services particularly preventive measures suggesting that intervention during early childhood could be the key to reduce association between health and class.

The importance of food has been known to people from prehistoric times but only when the association between nutrients and health was discovered; scientists were able to find a cure for many food-related illnesses. Malnutrition, which means lack of required

nutrients or excessive intake of nutrients that affects the well-being, is one of the main causes for many health problems in almost all the countries of the world. Malnutrition was one of the main reasons in recent years the world focused on nutrition, as nearly 60% of the 10.4 million deaths in children under five was due to malnutrition (World Health Organisation (WHO), 2003). Malnutrition caused due to insufficient food or lack of nutrients was found in developing countries causing diet-related diseases such as Marasmus (lack of food) and Kwashiorkor (lack of protein in diet). Whereas in developed countries, the malnourishment was caused due to excessive intake of energy foods or lack of essential micronutrients in the diet, causing diseases such as dental caries (excessive sugar intake) and anaemia (lack of iron). According to the World Health Organisation (WHO) (2011), the latest European statistics show that one in every three 11-year-old children is obese. WHO also indicated there is a steady increase in the number of overweight infants and children since 1990 in Europe. Childhood obesity is a high-risk factor for developing cardiovascular diseases, type 2 diabetes, orthopaedic problems and mental disorders. Obesity is also a key factor for children's underachievement in school and lower self-esteem (Dani, Burrill, & Demmig-Adams, 2005; Deckelbaum & Williams, 2001; Gable & Lutz, 2001).

Alderman et al. (2006) in their study, which was conducted in Zimbabwe, recognised that preschool malnourishment had lifelong implications both on children's physical growth as well as their academic achievements. Glewwe et al. (2001) in their longitudinal analysis of early childhood nutrition and academic achievement in Filipino children found that better-nourished children perform significantly better in school. Jukes (2005) also in his review of intervention studies in developing countries concluded that early years nutritional status affects the cognitive development of

children. Three Korean studies conducted on eating habits of pre-schoolers concluded that faulty food habits in early years will have long-term effects on the children's growth and development and these faulty food habits should be addressed as early as possible with new nutrition education approaches to improve the food choices of children (Choi & Yoon, 2003; Kim et al., 2001; Shin et al., 2005). Nutritional well-being in the early years not only has short-term implications but also has lifelong effects, and it was important to provide balanced-diet (Helle, Hillesund, Omholt, & Øverby, 2017). The research suggest early childhood nutritional status would have long term implications; so, if the child is educated about the importance of balanced diet it might aid them in making informed healthy choices.

Preschool education or Early years education is creating learning experiences for children below the age of 5 years or until they attend Year one. Hendricks, Echols, and Nelson (1989) in their study on the impact of a preschool health curriculum on children's health knowledge emphasised that health education inclusion in preschool curriculum was neither a new issue nor a debated issue. In the same study, she also referred to McCarthy's eight recommendations for successful health instruction, McCarthy in her report to the American Speech-Language-Hearing Association (ASHA) task force on early childhood health, the first and foremost recommendation was to begin health education during the preschool years. Nores and Barnett (2010) in their review of intervention studies concluded that early childhood interventions show substantial benefits in cognitive, behavioural, health and schooling outcomes, and they were sustained over years. Studies demonstrate that preschool education and care might not only have short-term benefits but also have long-term effects on the physical and physiological development as children grow into adults (F. A. Campbell & Pungello,

2001 ; F. A. Campbell, Ramey, & Pungello, 2002). Learning experiences were developed and introduced into early years education to maximise young children's experiences and aid in cognitive development (Burger, 2010). Preschool education provides long-term benefits for children's development; so, it could be beneficial to introduce nutrition education as early as possible and make it a part of early years children's cognitive development.

Lemer (2015), in her conference paper 'Our children deserve better: prevention pays', mentioned that health statistics in the UK show that 12.5 percent of toddlers were obese and there was also high chance of percentage of them growing into obese adults. This might not only affect the social and physical development of individual but also had a significant influence on state economy due to increase in healthcare and low productivity. She suggested intervention at early stages could save the country billions of pounds as studies in the United States of America (USA) had showed there would be a significant decrease in the costs even with 1 percent change. According to Rayner and Scarborough (2005), food-related health issues were costing National Health Services (NHS) £6 billion per annum which was twice the amount spent on accident-related health issues and thrice the amount spent on smoking-related health issues. About 10% DALYs (disability-adjusted life years) lost in the UK were based on food-related ill health. The majority of these health issues were attributed to unhealthy eating practices rather than the minority of them which were attributed to foodborne illnesses (0.2%) such as food poisoning. Therefore, the need for nutrition awareness has increased in the modern age and it has been shown that nutrition education can be an effective way of tackling disease caused due to faulty eating habits (K. J. Campbell & Hesketh, 2007). Lanigan et al. (2009) in their conference proceedings paper predicted

that by 2050 one-quarter UK under 16s children would be obese and recommended early intervention and also emphasised that early years period was the crucial time when long term dietary and physical activity habits were formed, which could have lifelong implications on health. A similar view was expressed by Bellows, Anderson, Gould, and Auld (2008) and Byrne and Nitzke (2002) in their studies: they mentioned that health advocates, who were either policymakers or researchers, agreed that effectiveness in improving public health could be maximised by providing nutrition education to early years children. Nutrition education is not only a strategy in tackling obesity in preschool-aged children but the way interventions were implemented in the childcare settings influenced the 'energy-balanced behaviours' and could be related to adulthood (Mouratidou et al., 2012). Therefore, nutrition education in early years not only helps in developing a positive attitude towards health but also might be an economic enhancement to the country in future.

The studies conducted by De Lauzon-Guillain et al. (2013) and Skinner et al. (2002) suggest that there was significant influence of early feeding and food acceptance on the habits in later stage of life; fruits and vegetables were better accepted in school-aged children, if they were introduced to children as early as 2 years. Cooke et al. (2004) in their study on traits which influence fruit and vegetable consumption indicated that two strong characteristics of children, food-neophobia and enjoyment of food, influence their choices of fruit and vegetables. So, if children are familiarised to healthy foods along with knowledge in early years, it could help in the development of healthy eating habits and also develop a positive attitude towards healthy foods.

Easy availability of processed foods and high-calorie sugary drinks (Lim et al., 2009; Linardakis, Sarri, Pateraki, Sbokos, & Kafatos, 2008) were the main contributing factors that increase the percentage of obesity among the young generation and caused various oral diseases. Tinanoff and Palmer (2000) in their review explaining the reasons for dental caries were frequent consumption foods with sugar content and also long term retention of food in the mouth. Therefore, in improving oral health and preventing dental caries, which was one of the main concerns in young children, nutrition education plays a vital role (S. Naidoo & Myburgh, 2007; Tinanoff, 2005). Nutrition education in early years might not only help in developing healthy life style but also aid in prevention of related health issues.

There might be a significant change in the lifelong eating habits of children if age appropriate nutrition education was developed and provided by parents and caregivers (Melanson, 2008). Nutrition education based on features which attracted children also increased acceptance of fruit and vegetables (Anderson et al., 2005). Hu et al. (2010) in their study on ‘Evaluation of a kindergarten-based nutrition education intervention for pre-school children in China’ concluded that kindergarten-based nutrition education not only improved the eating habits of the children but also showed change in the parents’ attitudes and eating habits. School-based intervention studies were effective tools in developing healthy eating habits and might help children make informed choices; these programmes should also include knowledge about related areas like preparation, preservation and storage (Perez-Rodrigo & Aranceta, 2001; Sothern, 2004).

Nutrition education in early years according to studies not only improved the acceptance of healthy foods, however, how it helps in making a knowledgeable food

choice should be further explored. Tickell (2011, p. 101) in her review of EYFS, while explaining the 'Aspects underpinning the areas of learning', expressed that

Developing a healthy lifestyle is important for young children in the 21st century, with increased risks to their well-being associated with obesity, junk food, and sedentary lifestyles. Learning to keep safe is an important element in the face of limitations imposed by a risk-averse society.

Studies suggest nutrition education is important in many ways to improve the early years children's lifestyles; in the following sections, pedagogical strategies to improve nutrition knowledge in children and their effectiveness are explored.

2.1.2. Nutrition learning experiences

In this section, studies were reviewed to understand the pedagogical strategies used in educating children about nutrition and their effective outcomes. Although the current study concentrates on nutrition knowledge development outcomes, due to a lack of studies targeting this outcome, all the learning experiences used in research studies were reviewed irrespective of the type of outcome studied. Some of these intervention studies could provide ideas on adopting these pedagogical techniques in achieving nutrition knowledge development outcomes. The outcomes through various learning experiences could provide an insight into the level of knowledge in nutrition education that could be achieved in early years children.

Before embarking on understanding the pedagogical techniques, the important nutrition education topics for preschool children as suggested by studies are examined. For children to develop healthy nutritional habits, it is important to understand what food choices are good for their health and importance of including different types of foods in

the diet. Importance of healthy diet and nutrients from various foods knowledge was considered important for children to understand (Baird et al., 2013; Choi & Yoon, 2003; D'Agostino, D'Andrea, Nix, & Williams, 2013; Melanson, 2008; Triador, Farmer, Maximova, & Willows, 2015; Tuuri et al., 2009; Williams et al., 2002). According to many studies children should understand about importance of fruits and vegetables and the national health promotional slogan of 'Five- a- day' could be an available method to introduce the topic (Ashfield-Watt, Welch, Day, & Bingham, 2004; K. J. Campbell & Hesketh, 2007; Mosley, 2013; Naska et al., 2000). One of the modern time concerns was the size of intake. The amount of energy-dense food consumed by young children was causing many health-related issues and as the large portion consumption could also lead to habit formation; so, it was stressed in research that children were educated about how much should be consumed and consequences (Fisher & Kral, 2008; Koletzko & Toschke, 2010; Looney & Raynor, 2011; McConahy, Smiciklas-Wright, Mitchell, & Picciano, 2004; Small, Lane, Vaughan, Melnyk, & McBurnett, 2013; Weber et al., 1999). The easy availability of high sugar content foods and beverages raised the need for educating children about the sugar content in foods and how different foods contain sugar (Kranz & Siega-Riz, 2002; Y. Lee & Joo, 2016; Lim et al., 2009; Linardakis et al., 2008; Public Health England, 2015). The high-calorie foods were also causing oral related problems, so children's knowledge about oral hygiene and knowing foods harmful for their teeth was considered important in research studies (Ashkanani & Al-Sane, 2012; Chan, Tsai, & King, 2002; McGrady, Mitchell, Theodore, Sersion, & Holtzapple, 2010; S. Naidoo & Myburgh, 2007; Schroth, Brothwell, & Moffatt, 2007; Vann, Lee, Baker, & Divaris, 2010). Research provides evidence there were many clinical dehydration cases over years which could have been prevented through consumption of water, so, studies state the importance of drinking water and the

number of glasses to be consumed should be educated to children (Bogart, Babey, Patel, Wang, & Schuster, 2016; Krystallia Mantziki et al., 2015; McConnochie, Conners, Lu, & Wilson, 1999; Sleddens et al., 2014). The research showed it is significant for children to understand about various healthy eating topics such as consumption of fruit and vegetable, water intake, controlling the amount of food consumed and also understanding sugar content in foods. This research aims at understanding how much of this knowledge children are gaining at the early years settings.

Research review reveals that many teaching techniques have been adopted, tested and developed to create a learning experience for preschool children about a healthy diet. The learning experiences differ for different techniques used some increased their nutrition knowledge, a few ignited their curiosity and others changed their attitude towards new foods. Anzman-Frasca, Savage, Marini, and Fisher (2012) in their study stated that according to many studies it is very important to adopt effective strategies to promote vegetables acceptance in early years as studies show there might be a decline in intake and acceptance from early years to adolescence. The nutrition learning experiences created by early years practitioners, at the settings for the child, play a vital role in the learning outcomes of children, this research aims at capturing these learning experiences and outcomes.

Storytelling is one of the traditional teaching strategies that could be adapted to convey nutritional messages. Lawatsch (1990) tried to identify which method might be more efficient for pre-schoolers the benefits appeal (the positive approach) or the threat appeal (the negative approach) as previous studies indicated threat method was effective regarding health issues. Traditional fairy tales were modified to convey the

nutrition messages of recognising the vegetables, their source and nutritional benefit to the body. Both versions of the stories were verbally told using flannel boards and picture cards, however, there was a variation in the type of illustrations used and benefit appeal stories version included rewards of eating vegetables and threat appeal had consequences of not eating a variety of vegetables. The conclusion of this study informed that though both approaches contributed to children's nutrition knowledge, benefit appeal had significantly higher scores. Byrne and Nitzke (2002) conducted an experimental study based on Lawatsch's study. A storybook which was based on vegetables was modified to include positive and negative messages about the unfamiliar vegetable- kohlrabi and the results showed that positive message group demonstrated slightly more willing to taste it than those in the negative message group, but it was not significant. This study shows that positive approach is more beneficial for preschool children to gain nutrition knowledge as to try new foods. Drzal et al. (2007) as a part of Michigan Nutrition team developed 250 children's books that contain positive nutrition messages. The team believing that linking reading books with nutrition and physical education could be a great way to not only improve children's reading skills but also improve their healthy life style knowledge, made the books available at preschools for the children to borrow. Many USA government departments funding this book initiative could indicate that policymakers also trust storytelling as an effective method to convey the importance of consuming healthy foods.

The visual aids used in the storytelling also play a key role in conveying the messages to children and recalling the message. Hand and finger puppets were found to be effective in storytelling and improving children's knowledge about healthy diet, as children were able to recall the characters and their messages about a healthy diet

(Davis, Bassler, & Anderson, 1983; Turner & Evers, 1987). In the same study conducted by Turner and Evers (1987) the visual aids such as cloth models and finger puppets were compared to a computer-based program and children were attracted to the computer for the colourfulness and appearance of characters, music, and their ability to interact. However, the results were limited to identification of foods on the computer-based program. Lawatsch (1990) also while using the pictures in her story used colourful and cheerful pictures for the benefit appeal and dark and sad pictures for the threat appeal stories, although the study did not analyse the impact of the pictures used, children's interaction with benefit appeal illustrations was considered positive. Therefore, not only storybooks and storytelling but also the illustrations and the visual aids used play an important role in conveying nutrition messages to children and by recalling the visual aids children could remember the knowledge gained.

Cason (1999) in her study on play's role in health education concluded that innovative and interactive strategies such as musical production encouraged good nutrition in children and about 97% of them were able to receive the nutrition knowledge messages conveyed in the video. Jenkins, Stumo, and Voichick (1975) evaluated a nutrition film series "Mulligan Stew" and stated that the children who watched the series showed a significant increase in nutrition knowledge. Films and marketing advertisements could be utilised to understand how to influence children and develop films or videos that could influence nutrition education (Bell, Berger, Cassady, & Townsend, 2005; Kraak & Pelletier, 1998). Films and television could be an important form of storytelling in this modern age which could be utilised in conveying nutrition messages to children but not many studies were found.

Role modelling is one of the most successful methods to encourage trying new foods. Duncker (1938) suggests that choice of certain foods could be either an influence of a story or social influence; social influence was “imitating actual or imaginary predecessors” which tends to be highly influential in social situations but faded as time passes unless the sensory aspects of food acceptance were influenced. Similar results were observed in other studies, food preferences in children of 4-5 years of age were influenced by the choices made by the group leader, however, the influence did not last (Hendy & Raudenbush, 2000; Marinho, 1942). These studies also indicate that child peer models were more efficient than the adult models and effective peer model was the child who was socially acceptable by children i.e. those who play well with other children. A study shows that more than 30% children try new food tried by peers at the table and also found that girl peer models were more influential at the tables than boy peer models (Hendy, 2002). The study by Branen, Fletcher, and Hilbert (2002) further suggests that children’s food acceptance was more influenced by modelling and encouragement than by the cuteness of food (enhanced appearance of food). Hendy and Raudenbush (2000) in their study found that preschool teachers rated role modelling as the most efficient practice in nutrition education; however, quasi-experiments indicated silent teacher modelling was ineffective and enthusiastic teacher modelling was effective unless a competitive peer model was present. Wardle, Herrera, Cooke, and Gibson (2003) in their study discovered that encouragement and reward along with continuous exposure to red pepper improved the acceptance levels, however, the encouragement method was slow and steady and had lasting effects, whereas the reward method had swift acceptance but also showed decline in acceptance as the rewards were no more attractive. Tuuri et al. (2009) in their intervention study suggested modelling and encouragement from teachers and cartoon

character heroes alone were not enough to induce greater liking for fruits and vegetables but children need constant exposure and knowledge for voluntary acceptance. Role modelling according to studies was more influential in making children accept foods, however, they also indicated that the results would not last unless knowledge was provided about the accepted foods. Therefore, there is need to understand if teacher-led discussions at meal tables could be a helpful way in improving nutrition knowledge along with the modelling.

Familiarity is an important dimension for preference in preschool children and it could be the predictor of consumption patterns in children (Birch, 1979). Children inclined to prefer the foods and flavours with which they were familiar and early introduction of new foods significantly increased the acceptance (Birch, 1999; Birch, Birch, Marlin, & Kramer, 1982; Rozin, Fallon, & Augustoni-Ziskind, 1986). Caregivers should continue to offer fruits and vegetables irrespective of children's facial expressions of dislike if the child is willing to continue feeding, repeated exposure to similar foods was effective in increasing the acceptance of fruits and vegetables (Forestell & Mennella, 2007). Cooke (2007) indicated that familiarisation of foods could be achieved by repeated exposure and it would act as the key factor to stimulate children to interact with the food item. Anzman-Frasca et al. (2012) in their study experimented to increase children's vegetable liking through "repeated exposure (RE) and flavour-flavour associative conditioning (AC)" and results indicated small portion tasting repetition with or without favourite dips showed positive results in acceptance. Lakkakula, Geaghan, Zanovec, Pierce, and Tuuri (2010) in their study indicated that children who disliked certain foods after repeated exposures to taste (even allowed to spit out in napkins) gradually increased the acceptance of foods. Repeated exposure to different novel fruits as part

of familiarisation trials was conducted on the two-year-old children and the results in choice trials indicated that exposure frequency determines the preference (Birch & Marlin, 1982). Niemeier, Tande, Hwang, Stastny, and Hektner (2010) conducted their study based on three components to improve nutrition knowledge of pre-schoolers:

- Education: to understand the importance of healthy foods, 'Color me healthy' a programme developed by Dunn, Thomas and Pegram (Dunn, Thomas, Pegram, Ward, & Schmal, 2004) was used to educate children;
- Exposure: new fruits and vegetables were introduced to the setting's menu, children encouraged to try each new fruit or vegetable (eight times in the four-week programme) but not required to eat;
- Environment: that provided support to child development, children discussed with their teachers and were encouraged to ask questions.

The study concluded that the most effective method to improve children's nutrition knowledge was a combination of nutrition education and frequent exposure to fruit and vegetables in a supporting environment. Matvienko (2007) also showed similar results in her experimental study of 'NutriActive Healthy Experience' which included nutrition lessons, exposure to healthy snacks and parent education. Traditional nutrition education methods such as repeated exposure on their own without any knowledge development activity did not improve the acceptance of healthy foods in children (Stark, Collins, Osnes, & Stokes, 1986; Wolfenden et al., 2012). The research evidence indicated that repeated exposure increases acceptance of foods but to retain the acceptance, familiarisation needs to be combined with nutrition education. Although research supports this view there was no academic evidence of its practice in early

years setting in England, this research aims at finding if children's nutrition knowledge is considered vital or not.

The acceptance of vegetables and fruits in children was greater if they grew their own. Household gardens increased the frequency of fruit and vegetable consumption and also could add diversity to a child's diet; an important means to achieve in nutrition education (Cabalda, Rayco-Solon, Solon, & Solon, 2011). A school-based 12-week intervention programme was conducted by McAleese and Rankin (2007), which included hands-on experience in the school garden and a nutrition curriculum based on 'Nutrition in the Garden, developed by Lineberger and Zajicek' not only increased their acceptance of foods but also improved nutrition knowledge and triggered their curiosity to know more about foods. 'Nutrition in the garden' was a garden-based programme that aided teachers to incorporate nutrition education into the curriculum, which included 34 activities covering a range of topics from nutrition to horticulture. Although through this programme there were no significant consumption improvements, there were significant attitude improvements towards vegetables and fruits (Lineberger & Zajicek, 2000). Morris, Neustadter, and Zidenberg-Cherr (2001) conducted a pilot study to check the feasibility of a garden-based education programme, the programme included classroom-based nutrition education and growing vegetables. This programme also showed similar results: children desired to taste grown fruits and vegetables and the other significant improvement was children's ability to identify food groups. Heim, Stang, and Ireland (2009) in their study discovered that children not only liked working in the garden (96%) and learning about them (92%) but also fruit and vegetable snack preparation (93%). Most children (98%) liked taste-testing fruits and vegetables. Many other school-based gardening interventions also

indicate that children's levels of fruit and vegetable intake increased considerably (Brouwer & Neelon, 2013; French & Wechsler, 2004; Triador et al., 2015), however, the combination of nutrition education and hands-on experience was important to achieve long-term results.

There have been a few studies over the years that developed play based nutrition education tools. Davis, Bassler, and Anderson (1983) developed a board game - the ABC's of Body Building which teaches children about nutrients and how they were useful in building their body. They also developed the concept of puppet toys and food models, in which a puppet represents the nutrient and a cloth food model represents the nutrient. Nutrition Relay Race was a sorting game developed based on the nutrition stories from storybooks by Geiger (1999) in which the selected story was read out loud then after a discussion on healthy and unhealthy food choices children divided into groups were asked to sort out the picture cards or food model into the allocated areas. However, there was no research evidence on these games success with regard to knowledge gain. Food-related activities that children included their roleplay were meal planning, food preparation, table preparation, serving food, eating, and cleaning (Matheson, Spranger, & Saxe, 2002). The visual recordings of these activities provided an insight into the children's interpretation of daily food experiences to the researchers and concluded that children had shown cognitive and environmental factor influence on their nutrition knowledge. The high quality pretend play could be a great opportunity to trigger the abstract thought process for children (Bergen, 2002). As these studies suggest, organised play or child-led play provides an opportunity for the practitioners to either provide nutrition knowledge or evaluate children's knowledge. Teaching methods of nutrition at the early years settings have included storybooks, puppets,

plays, repeated exposure, role modelling, games and so on... however, a combination of these approaches could be more effective than relying on one method (Birch, 1999; Knai, Pomerleau, Lock, & McKee, 2006).So, this research aims at understanding what methods were adopted to improve children's nutrition knowledge in the settings.

Many nutrition education programmes were developed over years which were age-specific and involved multiple activities.Picture cards and posters were used along with music and other physical activities in improving the nutrition knowledge of children in the nutrition educational programme 'Color Me Healthy' developed by Carolyn Dunn, Cathy Thomas, and Leslie Pegram. 'Color Me Healthy' was an interactive learning programme on physical activity and healthy eating. The 'Color Me Healthy' kit included teachers guide (12 lessons) , two kinds of posters for classroom and parents, 4 sets of picture cards along with songs CD(7songs). The kit used colour, music and exploration of senses to provide learning oppurtunities for 4 to 5 year old children. The programme also provided 14 reproducible parent newsletters which could help in reaching out for families and reinforce the messages children were learning at the settings. Children enjoyed using the programme as it was fun and interactive and about 92% children increased their knowledge about being healthy. Teacher's guide included lessons, which were 15-30min in duration , along with resources and ideas to enhance classroom resources.Teacher's guide also had a section on teacher being the rolemodel and the ways in which they could incorporate it in their classroom.The study claims the programme was successful as it addressed all the five influences of the socioecological model (Dunn et al., 2004; Dunn et al., 2006). Tuuri et al. (2009) through their ''Smart Bodies'' school wellness programme achieved significant results in improving the knowledge of children and also their attitude in making food choices. This

was also a multi-component interactive programme which included different types of activities and involved many social organisations. Başkale, Bahar, Başer, and Ari (2009) suggest, in their Piaget's Cognitive Development theory in planning and developing nutrition education programme, the practitioners should use only concrete, simple and correct expressions such as "help body grow" rather than abstract terms such as "nutritious for the body" for children to fully assimilate the nutrition concept. Studies show that early years children could gain significant nutrition knowledge through a nutrition education programme only when all the influential factors were coordinated and nutritional education materials were designed specifically to engage children (Anderson et al., 2005; Auld, Romaniello, Heimendinger, Hambidge, & Hambidge, 1998; Gorelick & Clark, 1985; Knepple et al., 2012; T. R. Lee, Schvaneveldt, & Sorenson, 1984a). Perez-Rodrigo and Aranceta (2001) in their review of the school-based nutrition education programmes inferred that could be effective, when the nutrition promotion strategies were "creative, engaging, inexpensive and widely disseminated." All these research-based interventions were successful in improving children's nutrition knowledge but to understand the real situation, there was need to explore what methods were adopted at the settings to improve children's nutrition knowledge and also how effective these methods were.

Many of these reviewed studies concentrated on using learning experiences to increase children's acceptance of foods, however, there were studies which confirmed children had the ability to understand nutritional concepts. Though acceptance was an important step towards a healthy life, nutrition knowledge acquired alongside might impact on children's attitudes and long-term behaviour. Studies show that pre-schoolers could understand about nutrients and their functions (Davis, Bassler,

Anderson, & Fryer, 1983; Skinner et al., 1985). Anliker, Laus, Samonds, and Beal (1990) in their study explored the impact of mother's communication on three and a half year-old children's nutrition opinions. The results revealed that children had a good understanding of nutrition knowledge especially in the areas of food groups, forms of food, sources of food and energy balance. Matheson et al. (2002) through their study tried to understand the food perceptions of children. They discovered that children classify foods based on colour, shape and texture which could be used in designing and developing nutrition programmes for children. Singleton, Achterberg, and Shannon (1992) conducted the study on 4-7year olds and in their findings indicated that children showed cognitive ability to learn about diet, they were able to conceptualise the relation between nutrition and health. Children (3-5years) after a six-week intervention programme showed a significant increase in nutrition knowledge; children were able to identify various foods, classify "good for you" foods, and understand the importance of hygiene (Gorelick & Clark, 1985). Intervention studies show that through nutrition programmes kindergarten children (4-5years) were able to understand the food kinds and their functions, relation between health and food, nutrients and their importance, and also hygiene importance(Gripshover & Markman, 2013; Hong, Park, Go, Jeong, & Song, 2010). Pre-schoolers could categorise healthy and unhealthy foods after they were taught about those foods, however, they were unable to categorise based on multi-dimensions (Nicholson, Barton, & Simons, 2017; Sigman-Grant et al., 2014). These studies show a vast difference in the children's level of understanding, but it could also be due to the level of education being provided to them. For example, Gripshover & Markman (2013,p 1542) in their study, 'Teaching young children a theory of nutrition', explained the process of digestion as "we taught children that after food enters the body, the stomach breaks it into smaller pieces and extracts the nutrients,

and then blood carries the nutrients throughout the body." As most of these studies were intervention studies the level of nutrition education provided in that particular programme was assessed at the end of each intervention study. These studies provide the awareness that the early years children have the cognitive abilities to understand the concepts of nutrition when taught at the level of children's understanding, so, the practicality of adopting these findings must be explored.

Nutrition concepts deciphered into an age-appropriate language which are clear and simple with no ambiguity could be successful to teach early years children. The level of nutrition understanding attained in children depends on the level of knowledge provided which in turn depends on the coordination between the practitioners, family, early years settings' policy and public policy. The various learning experiences associated with implementing nutrition education that have been reviewed in this section aided in understanding that a holistic approach might be effective in providing nutrition education to early years children. The nutrition programme could be holistic if the programme was developed considering all the factors which influence children's learning. The research evidence on the factors and how these various factors are affecting implementation of nutrition education is discussed in the following section.

2.1.3. Factors affecting nutrition education

Sizer and Whitney (2008, p. 12) in their book 'Nutrition concepts and controversies', mentioned that physical, psychological, social and philosophical factors influence food choices and some of those were advertising or media influence, availability, economy, emotional comfort, habit or familiarity, association to occasions or persons, geographical influence, social pressure, values or beliefs, nutritional value. Nutrition

education to be successful it must adopt a holistic approach but where this could not be feasible it must be multi-layered approach. The programme would be multi-layered approach if it addresses at least a few of the above-mentioned influences. The nutrition programme could be holistic if the programme was developed considering majority of the factors which influence children's learning. An ecological model as suggested by McLeroy, Bibeau, Steckler, and Glanz (1988) to design healthcare programmes could provide guidelines, according to this model, factors influencing learning could be classified into five categories. The following is the list of categories and the factors which influence:

(1) Individual- knowledge, attitudes.

(2) Interpersonal- group support, including the family and peers.

(3) Institutional factors- organizational characteristics such as policies and practices,

(4) Community factors- relationships among organizations, institutions, and family,

(5) Public policy- national laws and policies.

The reviewed research studies also indicate that many of these factors influence implementation of nutrition education directly or indirectly, so, understanding these factors and comparing with real time situations could help in managing their influence in implementing healthy diet education. The factors, which influence nutrition education in early years are:

- Intrapersonal factors: picky eating, neophobia.
- Practitioner-oriented: attitudes of practitioners, practitioners' perceptions, lack of training;
- Institutional factors: space availability, lack of resources;
- Family oriented: family beliefs, cultural influences; and also

- Public policy influences

The following paragraphs are set out in the similar order of the factors to discuss the reviewed studies except for public policy influences which are discussed in next section (2.2).

Intrapersonal factors such as picky eating and neophobia could be one of the many factors influencing children's nutrition education (Needham, Dwyer, Randall-Simpson, & Heeney, 2007). Common eating problems among the pre-schoolers are picky eating and not being willing to try new foods (Fuller, Keller, Olson, & Plymale, 2005). Eppright, Fox, Fryer, Lamkin, and Vivian (1969) in their study observed that 75% children were reluctant to eat at mealtime and most of the adults adopted negative approaches as punishments, force or threats to improve children's food acceptance. Hendy (1999) suggested there was a gender variation in fussy eaters; preschool girls could be fussier and more reluctant to try new foods. However, a survey conducted by Carruth, Ziegler, Gordon, and Barr (2004) indicate there was no significant difference in prevalence of picky eaters with gender or socio-economic backgrounds. According to 'social cognitive theory'- Bandura as cited by Hendy (1999) - the preschool mealtime could be a good opportunity for practitioners to encourage picky eaters to try new foods and increase the acceptance of healthy foods by peer influence as well as teacher role modelling. Repeated exposure for 10-15 times at regular intervals was found to be successful in studies, however, in practice parents or caregivers were found to accept food as rejected only after 3 or 4 exposure trails (Birch & Marlin, 1982; Carruth et al., 2004; Skinner et al., 2002). Young, Anderson, Beckstrom, Bellows, and Johnson (2003) developed a programme 'Food Friends: Making New Foods Fun for Kids' aimed at increasing the willingness of children to try new foods. The programme, which included

songs, stories and games, had an evaluation report indicated that there was an overall increase in the acceptance of foods in children, and the teachers also reported that the programme was easy to follow. So, although picky eating was identified as a factor influencing nutrition education, applicable solutions were also suggested in the studies.

The early years practitioners have a greater influence on children's food behaviour in modern times due to a significant increase in the amount of time children spend at early years settings (Wright & Radcliffe, 1992). Early years practitioners are in a position not only to increase the acceptance of foods but also to provide nutrition knowledge aiding in development of healthy diet behaviour as children are reliant on adults for food-related information (D'Agostino, D'Andrea, Lieberman, Sprance, & Williams, 2013; Gillis & Sabry, 1980; VanderBorght & Jaswal, 2009). Sharma et al. (2013) conducted a survey among preschool teachers as a part of their study to estimate their nutrition knowledge and attitudes: only a small percentage 3% responded to 4 out 5 nutrition knowledge questions correctly. 81% of them were unable to answer which food group must be consumed most and 52% of them chose an incorrect answer for the food with most calories: protein, carbohydrate or fat. However, other studies indicate that caregivers had good knowledge but due to various reasons were unable to reflect in their practices (Hoerr, Utech, & Ruth, 2005; Horodynski & Stommel, 2005; Omar, Coleman, & Hoerr, 2001). Fox, Condon, Briefel, Reidy, and Deming (2010) in their study found that caregivers should develop age-specific nutrient requirement knowledge so that they could put it in practice. Lee, Kang, and Kim (2011) in their Korean study indicated that there was no significant difference in the nutrition knowledge scores of preschool teachers and parents. A study on the nutrition training to preschool teachers showed an increase in their nutrition knowledge as well as quality

of practice of nutrition education (Unusan & Sanlier, 2007). The dissimilarities in knowledge levels of the practitioners could be due to variations in selection process of teachers in various regions and their educational backgrounds. However, it raises a concern about what knowledge was delivered to children implying a need for nutrition training for teachers.

Limited or lack of proper training for the practitioners is one of the major factors influencing nutrition education (Trost, Messner, Fitzgerald, & Roths, 2009). Sharma et al. (2013) nearly 54% of surveyed Head-start teachers in Texas USA expressed that it was hard to identify authentic nutrition information. This indicates preschool teachers need training not only to gain nutrition knowledge but also identify the right nutrition knowledge sources. Studies suggest that early years practitioners not only require in-service nutrition training by experts, but it should also be a prerequisite to deliver nutrition education. Studies also indicated that the technical content in training should be simple and practical; lesson plans and activities might be useful to facilitate and encourage nutrition education in preschools (Bruder, Mogro-Wilson, Stayton, & Dietrich, 2009; Derscheid, Umoren, Kim, Henry, & Zittel, 2010; Gillis & Sabry, 1980; Mooney, Boddy, Statham, & Warwick, 2008; Rye, Hunt, Nicely, & Shannon, 1982). Cook, Eiler, and Kaminaka (1977) in their study on nutrition education in K-6 children (3-5year-old) found that although 50% of surveyed preschool teachers stated a desire for nutrition training, only 6% requested a nutrition workshop when prioritised along with other subjects. Practitioners perception of nutrition was important in delivering nutrition education and the study shows that nutrition education might not be one of the priority subjects for early years practitioners.

Early years practitioners' perceptions and attitudes about food could affect the way nutrition education at the settings is implemented and 'entrenched beliefs' of practitioners could also become challenging hurdles (Başkale et al., 2009; Derscheid et al., 2010; Lumeng, Kaplan-Sanoff, Shuman, & Kannan, 2008). Ashkanani and Al-Sane (2012) and Chan et al. (2002) in their studies concluded that caregivers had weak knowledge on preschool children's oral health, education improved their attitude towards practices in favour of oral health. Children learn through observation; the actions and reactions of teachers might impact the nutritional reasoning of children. Studies also show that the opportunities such as mealtimes were not utilised by practitioners to promote nutrition and the reasons could be either lack of training or due to their own perceptions (Gable & Lutz, 2001; Hendy, 1999; J. Lee, Kang, & Kim, 2011). Cook et al. (1977) in their study observed that on an average only 9.7hours of class time per annum was spent on nutrition education although many of the practitioners felt it was important. J. Lee et al. (2011) also found in their study that although 97% of the preschool teachers expressed it was important to educate about nutrition only 42% of them implemented in their institutes. Shamasunder, Matsuoka, & Sims, (2014) in their comprehensive thesis, 'Farm to Preschool: A study on teacher support in nutrition education', discussed the pressure on teachers due to paper work and also it might be a stretch on them to expect more without providing resources and support to implement nutrition education. Although most of the practitioners in the studies agreed nutrition education in early years is important, it is not reflected in implementation, the reasons could be practitioners' perspectives or lack of support.

Institutional factors could influence implementation of nutrition education Shamasunder, Matsuoka, and Sims (2014) such as lack of space for physical activities,

lack of funding. Gardening facilities was a concern in many of the urban early years settings (Trost et al., 2009). According to the studies availability of resources to provide nutrition education was one of the concerns expressed by the settings. However, a study by Vereecken, Huybrechts, Maes, and Henauw (2008) had shown the type of meal provided could be utilised as a great resource to educate children about the healthy diet. While there was research evidence that intervention educational programmes such as 'Color Me Healthy' (Dunn et al., 2006) were effective, the availability of these educational materials to the settings and training to use them is of concern. Further steps are needed to bring research into practice. Mooney et al. (2008) suggested that in developing curriculum frameworks there were a few UK programmes such as 'Feeding Young Imaginations' by British Nutrition Foundation, and 'TOP Tots' and 'TOP start' by Youth Sports Trust which could be utilised and also suggested through partnerships between professionals at national and local level, resources could be developed which might facilitate health-promoting activities. The scalability of the suggestions is doubtful due to many factors such as the number of settings, the diversity among the settings, the financial implications and the main concern might be achieving uniformity across the settings in the country. However, the development as a cluster of settings either based on interests or geographical region could be feasible to temporarily pool resources which could be shared across to reach the standards and build an ideas bank.

In 2016 'Change4Life' released teaching resources as a part of School Zone to aid schools in delivering nutrition education as an inclusive part of a curriculum and also provides teacher training sessions. This pack was developed and aimed at providing

nutrition knowledge to primary school children (Reception, KS1 and KS2) (Public Health England, 2009, 2016c).

According to various ecological models for health promotion, education programmes for children should be planned taking into consideration the influences of families and communities, as children cannot be isolated from their influences (D'Agostino, D'Andrea, Lieberman, et al., 2013; Gielen, McDonald, Gary, & Bone, 2008; McLeroy et al., 1988). Lee et al. (2011) in their study observed that though there was no significant distinction in scores of nutrition knowledge between parents and preschool teachers there was a significant difference in the perceptions of nutritional issues. Studies provide evidence that the menus at childcare settings were appropriate and at recommended levels of nutrients but partnership with the parents were needed to improve the advocacy of nutrition education (Briley, Jastrow, Vickers, & Roberts-Gray, 1999; Bristow, Capewell, Abba, Goodall, & Lloyd, 2011; Hurst & Joseph, 2009). Mooney et al. (2008, p. 171) in their study re-established the fact that practitioners felt parents' cooperation was crucial to achieve healthy eating objectives. The interviewees in this study also expressed that it was also a challenging task to convince parents to change their behaviour; "While parents were often said to be 'verbally positive' about the notion of healthy early years provision, childminders' comments indicated that this enthusiasm could be 'in practice . . . a harder thing to follow through'." The study also suggests that the parental cooperation and engagement could be achieved if practitioners recognised that education was a gradual process and took time to establish the trust and communication partnership between staff and parents. The manner in which bilateral communication between the practitioners and parents takes place impacts the relationship and level of confidence developed (S. N. Lang, Tolbert,

Schoppe-Sullivan, & Bonomi, 2016). Goodall and Montgomery (2014) proposed a continuum, that was engaging parents in children's learning. The continuum was based on three points parental involvement with schools, their involvement with schooling and their engagement in children's learning. The continuum proposed was not a linear path from one point to the next but was a continuous process involving teachers and parents to develop a partnership in which might benefit children's learning. The communication between practitioners and parents is a key factor to gain parental cooperation for nutrition education implementation and which could make the approach holistic.

Dev et al. (2017) in their study explored the barriers and strategies in engaging parents in the nutrition education of children and few of the barriers were parents providing unhealthy food children and parents not being receptive about the nutrition knowledge shared by practitioners. The suggested strategies included developing relationship between practitioners and parents and communicating with parents about child's nutrition and health. The parents' knowledge about child's nutrition could be improved in various ways. HAPPY (Healthy and Active Parenting Programme for Early Years) and HENRY (Health Exercise and Nutrition for the Really Young) are few of the programmes being implemented as a part of 'Born in Bradford's Better Start' to improve the nutrition knowledge of parents. 'Born in Bradford's Better Start' is a lottery funded experimental birth cohort aimed at improving children's outcomes in three key areas: social and emotional development; communication and language development; and nutrition and obesity. The project aims at implementing 22 interventions in deprived areas of Bradford, UK to study the outcomes(Josie Dickerson et al., 2016). HAPPY and HENRY are the programmes aimed at improving the nutrition knowledge of the parents, Community Nutrition skills aims at improving the healthy cooking skills. El-Nmer,

Salama, and D. (2014) in their study observed that parent's nutrition knowledge had significant influence on the diet children consumed. So, educating parents about nutrition could develop positive attitude towards nutrition and which also could result in parents' engagement in children's nutrition learning.

The government policy could influence the implementation and shaping of nutrition education (Popkin, Duffey, & Gordon-Larsen, 2005), therefore, the nutrition policies internationally and in context to England are discussed in the next section after summarising nutrition education importance, implementation and influences.

Summary

Nutrition education is important in early years as the food habits from early years were traced to the adult food habits. So, nutrition education in early years could influence the healthy lifestyle development or aid in making an informed choice. Some of the nutrition topics suggested by studies to be included in the early years education were about the importance of variety in the diet, dental care, portion size and also water. There were many pedogeological techniques to enhance children's nutrition knowledge, however, studies indicated holistic approach programmes were more successful than a single teaching method. Many of the studies concentrated on acceptance of foods as the learning outcome but there were also studies which showed that the children have the cognitive ability to understand the nutrition concepts and approaches to develop it. Nutrition education in early years is influenced by children's acceptance, practitioners' perceptions, family influences and institutional factors. However, the studies suggest the factors influence could be positively inclined through practitioner training and supporting resources.

2.2. Nutrition within Health Education - origin, policies and curriculum

The nutrition education development and its importance in public policies and curriculum are discussed in three sections.

- Health promotion and health education: The circumstances which lead to the development of policies and education's influence on health promotion are reviewed in this section.
- English government nutrition policies: As the study was based on nutrition education in England the current and past nutrition policies were reviewed to understand the role of education in the healthy diet promotion.
- English educational acts and curriculum frameworks for early years: The current study was based on an aspect of Early Years Statutory Framework, so in this section, the development of policies related to nutrition education and early years curriculum development were discussed.

2.2.1. Health promotion and health education

This research focuses on the implementation of recommendations of early years statutory framework concerning nutrition education in early years settings in England which is a part of health promotion strategy. An introduction to the development of health policies in the UK and World Health Organisation's influence on these policies will provide an understanding of the situations that have led to the development of nutrition education recommendations.

The first impact of nutritional deficiency was found when 41 percent of British men failed to meet the criteria on health grounds while recruiting world war soldiers (Chamberlain, 2004). The evolution of nutritional policies started in the 1930s when the League of Nations was formed partly to tackle nutritional problems. In the UK, the 1932 hunger

marches and the British Medical Association report (British Medical Asociation (BMA), 1933) highlighted the need for focus and action planning to address under-nutrition. The second world war necessitated the British government to control the food in the country both due to the scarcity and concerns of the quality. The government played the main role in importing the food stuffs and rationing based on good nutrition practices to the population which lead in improvement of diet in all sections. (Mitchell, 1999). In 1948 National Health Services was launched to provide health services to all citizens of the UK (National Health Services(NHS)). Post second world war focus was on improving agricultural production and the government introduced many agricultural policies. This resulted in an exceptional level of change in strengthening the food reserves and ensuring prolonged price stability throughout the second half of the twentieth century. The rationing of food and subsidies continued until 1954, strong measures in the agricultural sector and in public welfare over next few decades resulted in tackling under-nutrition (Boatman, Parry, Bishop, & Cuthbertson, 2007). Thereafter, new problems started to emerge due to over-indulgence in food commodities such as meat, sugar and fats that were rationed during World war II. People eating these deprived foods decreased the amount of vegetables consumed and also increased the number of calories in their diet according to the survey conducted by the research division of W. S. Crawford in 1956 (as cited in (Mitchell, 1999)).

The change in eating habits of the population started to impact the public health status and by the 1970s, concerns about nutrition shifted from under-nutrition to malnutrition. The concerns about heart diseases were raised by the Committee on Medical Aspects of food policy (COMA) reports in 1974, 1984 and 1994. These reports stated there was a relation between the type of diet consumed and coronary heart diseases (de la Hunty,

1995). The ‘Inequalities in health’ report commissioned in April 1977 reported high morbidity and mortality rate of children in the UK and it was much higher compared when compared to the Nordic countries (Denmark, Finland, Norway and Sweden) and the Netherlands. The report apart from suggesting early childhood intervention also recommended the ‘National Food Survey’ which could be utilised as a nutrition surveillance instrument to identify the vulnerable groups (Black et al., 1980). Although this report caused some political debates, it brought the attention of the government towards the prevailing health problems, however, later the Whitehead report (1987) and the Acheson report (1998) were similar to that of Black report and reported that underprivileged were more prone to health problems (National Health Services(NHS), 2015a).

The governments of many countries approached and tackled health issues either by controlling the supply chain or improving medical facilities but the first international health conference for Health promotion in Ottawa organised by WHO provided a new perspective to improve public health. Health promotion as explained in the WHO webpage: “Health promotion is the process of enabling people to increase control over, and to improve, their health.” (World Health Organisation (WHO), 1986). This definition of health promotion in the conference resulted in a change of approach for many policy-makers and resulted in the empowerment approach. Although health promotion and well-being strategies were developed and implemented from late 80’s, the changing health scenarios prompted European countries to develop new approaches to tackle the problem. In the 1992 Maastricht Treaty, the European Commission was charged with acting on health primarily through education and promotion. “Community action shall be directed towards the prevention of diseases, in particular, the major health

scourges, including drug dependence, by promoting research into their causes and their transmission, as well as health information and education."(Council of European Communities, 1992article129).

Education about health provides an opportunity for the person to explore more options and provides an opportunity for conducive decisions. Scriven and Stiddard (2003) in their study on empowering schools stated that since the Ottawa WHO conference on health promotion, the word empowerment has "become the catchword and philosophical tenet for health promotion." Empowerment also emerged as a theme in health promotion in WHO strategy 'Health for All' and promoted worldwide in many countries coordinated by International Union for Health Promotion and Education (Jones et al., 2006). Tones and Green (2004, p. 4) in their book on health promotion, emphasized that the success of health promotion can be conceptualised as the interaction between education and policy. They further stated that "Most health educators would also agree that a supportive environment will maximise the impact of their educational activities and this is undoubtedly true. What is rarely stated is that, without education, significant health-promoting policies will not take place." Health promotion is just not about collecting health-related material but to develop an understanding about health and the causes of illness, for which health education is to be approached in a new perceptive than the traditional 'expert authority model' used in health promotion (J. Naidoo & Wills, 2000, p. 80). Nutbeam (2000) indicated although transmission of health information is the fundamental task, making population health literate needs much more effort. Education plays a key role in the process of understanding the policy and it might provide the power to make informed choices.

In the UK, Health Education Authority (HEA) was established in 1987 to promote health and health education; Later in 1992 ‘The Health of The Nation’ was started, the first health promotion strategy to tackle health inequalities in the society (Department of Health (DH), 1992). In England, 26 Health Action Zones were located across 73 local authorities and served 13million people and were established in 1997 with the objectives of identifying the local health needs, improve the service efficiency and also build partnerships between different health agencies (Department of Health (DH), 1999). Though the attempt to tackle the problem was appreciated, the approach to the solution was widely criticized as socio-economic factors were completely ignored and only ‘disease- based model’ was followed (Hunter, Fulop, & Warner, 2000). In 1999 ‘Saving Lives: Our Healthier Nation’ replaced the ‘The Health of The Nation’ although the approach to the health issues remained the same focus was laid on only ‘four main killers’- stroke, cancer, mental health and accidents. Health Development Agency was setup replacing HEA as an advisory to develop policies through research and evidence; it also encouraged community-based partnerships for health promotion such as in schools and workplaces (Department of Health and Social Care (DHSC), 1999).

Schools were the ideal choice for health promotion as they represent the population and the early and long exposure of health education could aid in development of healthy lifestyles. “There are reciprocal benefits between education and health, and improvements to young peoples' health status as a result of health-promoting activities have been shown to contribute to improved educational attainment (International Union for Health Promotion and Education, 2000)”(as cited in (Scriven & Stiddard, 2003, p. 111)).

Later there were many improvements in the health policies and departments, the current health strategy plan is ‘Better outcomes by 2020’ which also focuses on empowering people to understand the implications and make informed choices to decrease avoidable diseases caused due to behavioural patterns such as unhealthy diet and tobacco (Public Health England, 2016c).

Concerns about obesity and nutritional standards of school meals had risen in the UK by early 2000. According to T. Lang, Barling, and Caraher (2001) since then there have been many policy debates concerning the amount and nature of intervention that was required. Social nutritionists stress education rather than restrictions, to safeguard food democracy (the right to choose). The right to choose was the driving force which led policy-makers to develop policies which support and encourage nutrition education. In 2003, the WHO and the Food and Agricultural Organisation (FAO) released a review on diet, physical activity and health, which stressed the need for wide-scale policy change.

T. Lang, Barling, and Caraher (2009) writing on food policies has asserted that there are three traditions in nutritional attitudes

- Life sciences nutrition, focusing on nutrient content and chemical composition of food and its interaction with physiology.

- Social nutrition, focusing on food choice as a part of culture, society and living.

- Eco-nutrition, a comparatively new branch emphasising environmental consciousness in both production and consumption of foods.

They vary not only in their perspective and approach but also in their influence, support and funding by particular states. In this research all the three components of nutritional

attitudes influence on the implementation of nutrition education in early years were explored: how much nutrition knowledge was provided, what were the social and cultural factors influence and sources of food.

The following paragraphs are set out to briefly explain the evolution of nutritional policies in England. The changes in policies might help understand their implications on nutritional education for young children in England.

2.2.2. English Government nutrition policies

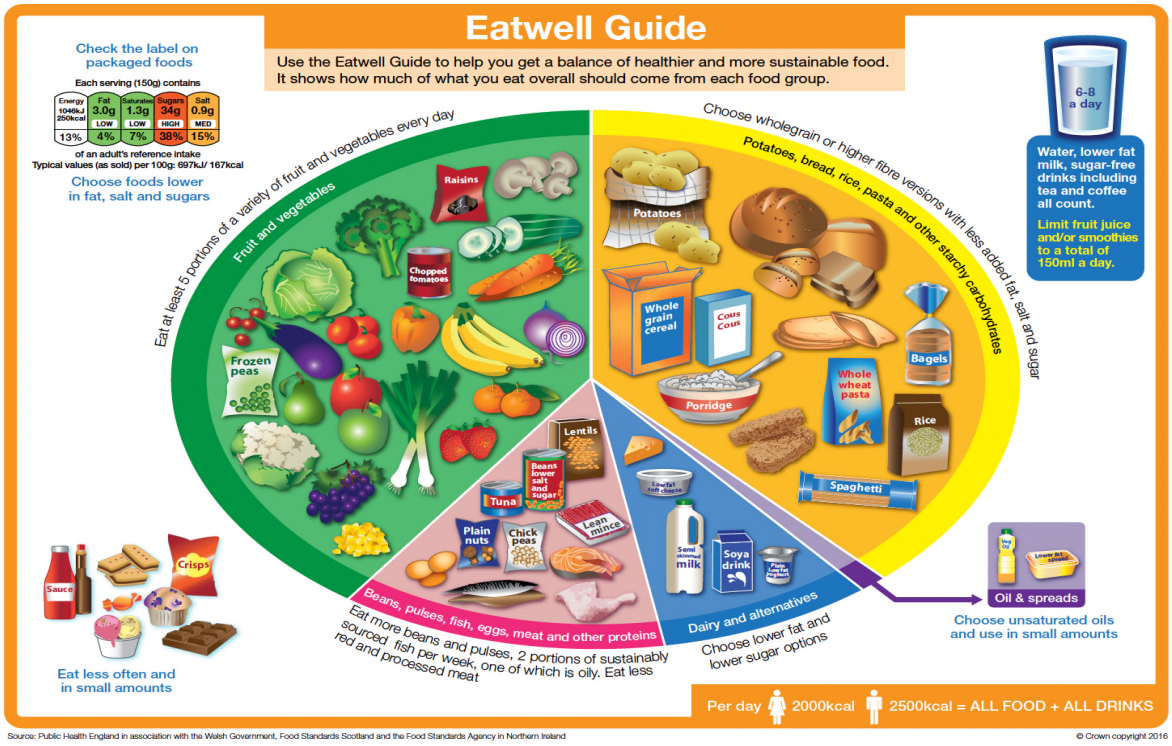
Education to create awareness about healthy diet was known through research as the affirmative approach, educational policies including nutrition education at various levels evolved over years. Nelson (1997) in his article mentioned that, 'The Nutrition Task Force (NTF)' was started to achieve the dietary goals and it published its first report 'Eat Well' in 1994.

Barling, Lang, and Caraher (2002) reviewed policies in the UK,

> To address the policy malfunctions of the recent past and present, UK food policy needs to link policy areas that in the past have been dealt with in a disparate manner, and to draw on a new ecological public health approach.

The UK governments had introduced many policies and development plans for children in early years over the past two decades. The approach to these policies and plans is different in the four countries of the UK. This review focuses on English government's approach to related policies and their implementation as the current research was based in England.

Figure 2.1. Eatwell Guide as sourced from Public Health England.



Eat Well, the national food guide, launched the government encouraged model 'Balance of Good Health'. This model provides government's advice on a healthy and balanced diet. Later in 2007, it was renamed as 'eat well plate' which was recommended by the Departments of Health and Education in England. The eat well plate represents the main food groups and the size of portions recommended for a healthy diet.(British Nutrition Foundation (BNF), 2016). In 2016, the Public Health England (2016a) revised the 'eat well plate' and renamed as the 'Eatwell Guide' this new version had resized food group segments and the foods included in each segment along with the message for hydration. It also includes a message about reading the label on packaged foods. However, the guide is not suitable for children under 2 years and the children from 2-5 years were advised to slowly adopt the family meal pattern and could follow the dietary guidelines and proportions unless have special dietary or medical requirements (Public Health England, 2016b).

There were many government health promotion campaigns over years to promote healthy eating habits in people. ‘Change4Life’ is one of the latest nutrition campaigns using technology and media to reach public. ‘Change4 Life’ was launched in 2009 by National Health Services(NHS) (2015a), as an advertising campaign aimed at encouraging people to have a healthier diet and exercise more. Public health of England developed this programme and encourages healthy food swaps, exercises and tips to be healthy. This programme also developed mobile applications to scan food item barcodes and know the sugar content, utilising mobile technology and providing the alternative foods information to make healthy swaps are the unique features of this programme (Public Health England, 2009).

United Nations Convention on the Rights of the Child (UNCRC, 1989), Article 24, voices to every child “You have the right to the best healthcare possible, safe water to drink, nutritious food, a clean and safe environment, and information to help you stay well.” This right along with many other child rights was agreed by almost every country (Convention on the Rights of the Child (CRC)). This right for children to choose is important to know, as it determines the working style with children. Children might become active decision makers than the decision receivers with regard to their well-being. This also lays a responsibility on adults to provide the correct information to children to make choices.

Table 2.1 provides a glimpse of various school diet policies and their implications in chronological order and some parts of the table were sourced from Albon and Mukherji (2008, p. 16). There were many policies developed and implemented since 1906 in England, most of these were aimed at providing a healthy diet to children. However,

the standards of the diet provided at schools and their nutritional value was questioned over years (Noble, Corney, Eves, Kipps, & Lumbers, 2000). In 2001, National standards for school meals was introduced and from then the standards of food provided at schools started to improve; later studies and government reports provided evidence that the standards have improved although there were certain educational settings which needed further support to meet the standards (Buttriss, 2005; Buttriss & Stanner, 2005; Crawley, 2006; Office for standards in education (Ofsted), 2004). 'School Food Trust' was set up by the government in 2005, as the next step in improving the standards of school meals. The School Meals Review Panel's report 'Turning the tables- transforming school food' provided recommendations for schools to support healthy living and work towards Healthy School standards (School Meals Review Panel, 2005). These recommendations were implemented since 2006 and in 2013 a 'School Food Plan' was set up by Department of Education along with some charitable trusts to provide further guidelines in improving school meals. All these guidelines and standards set up might ensure the child's right for a nutritious meal but the evidence for the child right to choose should be explored.

Gustafsson (2002) in his paper on school meals policy articulation in England, expressed that "If school meals policies were to accept children as active social agents they might well be invited to participate more visibly in this process." The school meals policy visualizes children as recipients rather than participants and there were certain social stigmas which hinder children's direct involvement in the policy planning aimed for them. Although there is a long road to travel before, we reach this aim, involving children in food-related activities such as menu planning and preparation at the school level could provide them with an insight into the nutritional standpoint. This way of

involving children in food preparation and growing was recommended by many studies and government reports, as a part of providing them nutrition education (Crawley, 2006; Department of Health (DH) & Department of Education and skills, 2005; Goodwill, Brine, & Department of Education (DfE), 2017; Hersch, Perdue, Ambroz, & Boucher, 2014; Office for standards in education (Ofsted), 2004; Public Health England, 2016b; School Meals Review Panel, 2005). These little steps of involvement and the education to understand the implications of healthy and unhealthy foods might build children's ability to make independent food choices.

There are many policies developed and implemented in the country to tackle food related health issues and schools play a vital role in implementing many of them. As table 2.1 indicates many policies were implemented by government to improve the nutritional standards for school children. Few of them were by providing nutritious diet in the schools. Milk scheme for children under 18 years was started in 1946 but from early 1970's it is restricted to children under 5years old and to the children who were entitled to free school meals in the primary school. In late 1980s, the focus on the quality of school meals came into attention and over years many measures were taken to improve the standards of school meals. Since 2013, every child from year 1 and 2 in stated funded schools were entitled to free school meals. The recent set of school meal standards were being implemented from January 2015, which includes provision of at-least a portion of food from every food group every day, limiting the foods high in fat, sugar and salt to only two portions a week and also complete removal of sugar or honey added drinks, crisps and chocolates from school premises. Government has acknowledged the benefits of 'Magic Breakfast' run by the Family Action charity since

2000 and from March 2018 breakfast is being provided at many schools in deprived areas as National School Breakfast Programme.

In April 2018, a levy on soft drinks based on their sugar content has been executed, to discourage children from having sugary drinks. The revenue collected through this tax would be utilised in improving the physical exercise facilities at primary schools and also in measures to tackle childhood obesity.

Learning about food could be more practical and efficient if it becomes a part of the curriculum and is embedded in all the subjects. In, 2009, Department of Health launched ‘Change for Life’ campaign to support families and schools to support and improve children’s eating habits. However, to achieve the nutritional education goals understanding the educational system and the government guidelines for curriculum is important. Therefore, the next section is set out to understand the English early years education.

Table 2.1. Policies development in England in relation to school children's food.

1960	• The Education (provision of meals) Act introduced, giving authority to local education authorities (LEAs) to provide meals.
1941	• Welfare Food scheme introduced for children under 4 years and pregnant and breast feeding mothers. nutritional standards for school meals set nationally.
1946	• School Milk Act provided 1/3 pint of milk for every school child under 18.
1944	• The 1944 Education act, section49, made it a duty for LEAs to provide school meals for all children who wanted one. Free school milk made available to all
1968	• Secondary school children were exempted from free milk.
1971	• Entitlement to free school milk for over 5 abolished. Nursery Milk scheme provides 1/3 pint of milk to under fives or to those entitled to benefits in primary schools.
1980	• Education act, sections 22 and 23, gave LEAs the power to abolish school meals apart from for those children entitled to a free meal. Nutritional standards abolished. Free milk for children between 5-7 years ended.
1986	• Social Security Act means children whose families receive Family Credit are not entitled to a free school meal or milk.
1988	• LEAs had to put catering services out to compulsory competitive tendering (CCT) following Local Government Act
1992	• Department of Health publishes 'The health of the nation' which includes public health targets around food and eating.
1998	• Excellence in Schools published by the DfEE, aimed at helping schools become 'healthy schools'.
1999	• Department of Health report, 'Saving lives: Our Healthier Nation', high lights the key role schools ought to play in educating children about health, including healthy eating, leading to the National Healthy School Standard (NHSS).
2000	• Broadening of national curriculum to include Personal, Social and Health Education.
2001	• National nutritional standards for school meals introduced. National childcare standards, section8, give guidance around the provision of food and drink in childcare settings.
2003	• Birth to three matters includes "A healthy child' as one of its four areas
2004	• Department of Health publishes Choosing Health. Childcare act 2004 implements the 'Every Child Matters' five out comes, including 'Being healthy'.
2005	• School Food Trust set up, comprising food experts to advise the government.
2006	• New food-based standards, set by School Food Trust, introduced across all schools.
2007	• The Early Years Foundation Stage is finalized with explicit references to young children's food and eating.
2009	• 'Change 4 life' advertisement campaign was launched by Public Health of England to support parents support their children with healthy lifestyle, and 'Start4 Life' to provide information for babies.
2013	• The School Food Plan was published by the Department for Education, it sets out 17 actions to transform what children eat in schools and how they learn about food.
2014	• Every child in reception, year 1 and year 2 in state-funded schools were offered a free school lunch.
2015	• A new set of standards for all food served in schools came into force in January 2015, this allows only healtheir drinks without added sugar and also only two portions of deep-fried or pastry per week.
2018	• National School Breakfast Programme, in partnership with Magic Breakfast and funded by the Department for Education, is working to support 1775 schools in disadvantaged communities .
2018	• Manufacturers have to pay a levy on the high-sugar drinks they sell and the revenue generated through this would be utilised in in improving the physical exercise facilities in schools.

2.2.3. English education acts and curriculum frameworks for early years

In 1816 the first nursery school in the UK was set up, and since then there have been many developments in the early education (Young-Ihm, 2002). Since 2010 all 3 to 4-year-old children in the UK have been entitled to 15hours free early years education, thus making early education accessible to every child in the country. Therefore, early years settings might be playing a vital role in the child's overall development (Barnett, 2008; Brewer, 2006). All early years settings in England were statutorily required to follow Early Years Foundation Stage (EYFS) framework since 2008 (which has not been compulsory from September 2016). The framework provided an outline of the curriculum to be followed in early years settings throughout England. The framework emphasised on primary areas and key aspects to be concentrated on in each primary area. "Every child needs to know about healthy diet" is one of the key aspects in Physical Development area (Department for Education (DfE), 2014b).

Nursery education significance was emphasised in government welfare schemes over the years (as listed in Table 2.2) and constant measures were taken to improve the standard of nursery education in England. In 1996 a Nursery Education Voucher scheme was introduced for all 4year olds following the Nursery Education and Grant-maintained Schools Act (Sparkes & West, 1998). However, this scheme failed due to lack of proper regulations and was abolished in 1998 and a new scheme National Childcare Strategy was a "complex initiative for the development, expansion, implementation and sustainability of early years and childcare services." (The National Childcare Strategy, n.d.). Local authorities were also involved and encouraged to identify the need for nursery settings and, in particular developing partnerships which were maintained by Early Years Development and Childcare Partnerships (EYDCP).

In 1999 the Sure Start programme guided young children in minority ethnic groups to acquire proper preschool education and aimed to develop cohesion in the population (National Evaluation of Sure Start (NESS), 2002).This programme is still being implemented focusing on supporting families with young children.

In 2003 a Green Paper was submitted to parliament, entitled Every Child Matters. This defined key aspects for every young child including being healthy, staying safe, enjoying and achieving, making a positive contribution, and economic well-being. In the following year (Legislation Government of UK, 2004) Children Act required local authorities to implement 5 outcomes, in collaboration with partners in their local area. The expected outcomes for young people were:

- Physical and mental health and emotional well-being.
- Protection from harm and neglect.
- Education, training and recreation.
- The contribution made by them to society.
- Social and economic well-being.

The Childcare Act (2006) (Legislation Government of UK, 2006) defined “young child” as “beginning with his birth and ending immediately before the 1st September next following the date on which he attains the age of five.”

It also defined “early years provision” to mean the provision of childcare for a young child. This act specified the rules and regulations to be followed both by the government and early years education providers.

The curriculum development and importance of standardising education across the settings in England started around 1990s. The School Curriculum and Assessment Authority (SCAA) set out Desirable Learning Outcomes for early years in 1996. These

Desirable Learning outcomes were to be assessed before the child entered reception. In 2000 the Qualifications and Curriculum Authority (Qualifications and Curriculum Authority (QCA), 2001) released the Foundation Stage framework, for children from the age of three years to the end of reception (having passed their sixth birthday). This Framework was introduced to be implemented in state-funded nurseries and schools; it was later made statutory for all nurseries, both public and private, by the 2002 Education Act. This framework consists of six areas of learning, with several aspects within each area.

The six areas were:

- Personal, social and emotional development (PSED)
- Communication, language and literacy (CLL)
- Mathematical development (MD)
- Knowledge and understanding of the world (KUW)
- Physical development (PD)
- Creative development (CD)

In 2002, a plan of action for children aged below three years was released as Birth to Three Matters, (Abbott & Langston, 2005) mainly emphasizing child development with aspects including: A Strong Child, A Skilful Communicator, A Competent Learner and A Healthy Child. The EYFS statutory framework was introduced in 2008, for children from birth to 5 years old. The stated purpose of the framework was to provide assurance to parents of their children's safety and to give guidelines to early years practitioners in achieving Every Child Matters expected outcomes. The EYFS framework adheres to the Childcare Act (2006) and to later amendments made to it (Department for children schools and families (DFE), 2008).

Table 2.2. Policies and curriculum frame work development in early years education, England.

1996	• Nursery Education Voucher Scheme as apart of Nursery Education and Grants Maintained Schools Act • Desirable learning out comes.-Assessed in area of learning: Personal and social development; Language and literacy; Mathematics; Knowledge and understanding of the world; Physical development; Creative development
1997	• May 2, 1997, the Secretary of State of Education abolished the Nursery Education Voucher scheme and set out the new early years policy
1998	• National child care strategy: Diversity; Accessibility; Inclusion of special needs and disabled children; Equal opportunities; Quality; Affordability; Accessibility; Integration of early years education with childcare; Access to accurate local information
1999	• Sure start: Sure Start Local Programmes (SSLPs) reaching up to 150,000 children in areas of deprivation. Initially government planned for ten years. Later it's extended and in 2004 Sure Start Local Programmes changed to Sure Start Children's Centers
2000	• Foundation stage for children aged 3-5 years. Curriculum guidance for six areas of learning: Personal, social and emotional development; Communication, language and literacy; Mathematical development; Knowledge and understanding of the world; Physical development; Creative development
2002	• Education act Birth to three matters curriculum-Frame work with four aspects: A strong child; A skillful communicator; A competent learner; A healthy child.
2003	• Every child matters : Stay safe; Be healthy; Enjoy and achieve; Make a positive contribution; Achieve economic well-being.
2004	• The Children Act 2004: to make provision about services provided to and for children and young people by local authorities and other persons
2006	• The Childcare Act.2006-An Act to make provision about the powers and duties of local authorities and other bodies in England in relation to the improvement of the well-being of young children.
2008	• Early years foundation stage Framework: There are six areas covered by the early learning goals and educational programmes: Personal, Social and Emotional Development; Communication, Language and Literacy; Problem-solving, Reasoning and Numeracy; Knowledge and Understanding of the World; Physical Development; Creative Development.
2012	• Early years foundation stage Framework:Prime areas: Personal, social and emotional development; Physical development; Communication and Language. Specific areas: Literacy, Mathematics, Understanding the world, Expressive Arts and design.
2014	• Early years foundation stage Framework: Similar to EYFS 2012. There are changes in some of the administrative rules.
2016	• Early years foundation stage (EYFS) national curriculum assessment is statutory reporting for the 2015 to 2016 academic year. It is produced by the Standards and Testing Agency (STA), an executive agency of the Department for Education (DfE). Practitioners must complete the EYFS profile for each pupil who will be 5 years old unless exempted.
2017	• Early years foundation stage Framework:Prime areas: Communication and Language; Physical development; Personal, social and emotional development. Specific areas: Literacy, Mathematics, Understanding the world, Expressive Arts and design. Assessments: Progress check at age two; Assessment at the end of the EYFS – the Early Years Foundation Stage Profile (EYFSP)

The EYFS framework defines as well as sets guidelines to reach expected levels of achievement in the six learning and development areas which were similar to QCA framework except for the Mathematical development area which was included as problem-solving, reasoning and numeracy. The six learning and development areas were:

- Personal, Social and Emotional development.
- Communication, Language and Literacy.
- Problem-solving, Reasoning and Numeracy.
- Knowledge and Understanding of the world.
- Physical development.
- Creative development.

In this framework, an educational programme for each of these areas was defined. Early years goals were also set, which should be achieved by children by the end of EYFS. An assessment procedure for children in the final year of EYFS was defined. The EYFS profile for each child should be prepared using thirteen scales with 1-9 points, though the hierarchy of the scales was not important.

The EYFS (Department for Education (DfE), 2012) statutory framework was further improved and re-implemented in September 2012. The EYFS framework suggested shaping into seven areas of learning and development with each area having defined Early Learning Goals (ELGs). Out of the seven areas, three areas were considered as prime areas. These prime areas of learning and development with ELGs were:

- Communication and Language (Listening and attention; Understanding; Speaking)
- Physical development (Moving and handling; Health and self-care)

- Personal, social and emotional development (Self-confidence and self-awareness; Managing feelings and behaviour; Making relationships).

The other four of seven were considered as specific areas of learning and development through which the prime areas of learning and development must be enhanced.

The specific area of learning and development with ELGs were:

- Literacy (Reading; Writing)
- Mathematics (Numbers; Shape, space and measures)
- Understanding of the world (People and communities; The world; Technology)
- Expressive arts and design (Exploring and using media and materials; Being imaginative)

Table 2.3. The key differences between prime areas of learning and specific area of learning (sourced from Tickell (2011, p. 96)).

Prime	Specific
Are time-sensitive. If not securely in place by the age of 5, they will be more difficult to acquire, and their absence may hold the child back in other areas of learning.	Are less time-sensitive. Specific areas of learning reflect cultural knowledge and accumulated understanding. It is possible to acquire these bodies of knowledge at various stages through life.
Are characterised by their universality. They occur in all socio-cultural contexts.	Are skills and knowledge which are specific to priorities within socio-cultural contexts.
Are not dependent on the specific areas of learning, although the specific areas of learning provide the context for their development.	Are dependent on learning in the prime areas – the specific learning cannot easily take place without the prime.

Table 2.3 outlines the differences between the prime areas and specific areas which might aid in understanding each area's importance. "Children engage in activities which

support their learning in specific areas by using their physical, communicative and social abilities, so that in the early years the prime areas are inseparable from all experiences." (Tickell, 2011, p. 95).This indicates that prime areas and specific areas are interdependent and play a key role in the holistic development of the child.

Along with defining educational programmes and early learning goals for each learning area, this framework also defined the three main characteristics of effective teaching and learning which must be implemented in practice. The three characteristics were playing and exploring-engagement, active learning- motivation, and creating and thinking critically. With regard to assessment, the 2012 EYFS framework (p.10) states "When a child is aged between two and three, practitioners must review their progress, and provide parents and/or carers with a short-written summary of their child's development in the prime areas". The EYFS profile must be prepared by continuous observations and evaluations by the carers as the child enters year 1, essentially to check the readiness of each child for formal education. This EYFS profile must be prepared in the final term of the year in which the child reaches 5 years old (Standards and Testing Agency (STA), 2016b).

There was a new EYFS framework, which was implemented from 1st September 2014 in all the Early Years Provisions till further notice (Department for Education (DfE), 2014b). The learning and developmental areas and the assessment methods were similar to those defined in the 2012 EYFS framework. However, the new framework elaborated on actions to be taken in case of disqualification of early years provision and it also did not consider learning outcomes in the before- and after- school care provisions or in school holiday care settings.

In October 2016 the EYFS profile handbook was released as the guidelines for practitioners to make accurate and consistent judgements regarding children's outcomes in the EYFS profile assessment. The main purpose of the EYFS profile was to provide a reliable, valid and accurate assessment of individual pupils at the end of the EYFS (Standards and Testing Agency (STA), 2016a).

EYFS profile was used to:
inform parents about their child's development against the Early Learning Goals (ELGs) and the characteristics of their learning; support a smooth transition to key stage 1 (KS1) by informing the professional dialogue between EYFS and KS1 teachers; help year 1 teachers plan an effective, responsive and appropriate curriculum that will meet the needs of all pupils. (Standards and Testing Agency (STA), 2016a, p. 9).

In April 2017, the new EYFS was implemented which had all areas of development similar to previous EYFS frameworks but the assessments progress check at age two and EYFS Profile (EYFSP) were made statutory. Guidelines were provided for these assessments to achieve uniformity across the settings (Department for Education (DfE), 2017a).

In all the four frameworks including the latest EYFS (2017a), physical development had an early learning goal – health and self-care- "Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe." (EYFS 2008, 2012, 2014 & 2017). The non-statutory guidelines were released in 2013 for inspectors and practitioners tabulating what should a child demonstrate for each learning goal if the child was developing normal.

According to these guidelines the children between $3_{1/2}$ to 5 years should be able to demonstrate that they could “Eat a healthy range of foodstuffs and understand need for variety in food; Show some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.” as a part of health and self- care learning goal (Department for Education (DfE), 2013, p. 14).

In the latest EYFSP assessment guidelines for the ELGs were developed based on Dame Clare Tickell’s report on EYFS in 2011. She suggested the outcomes for each ELG, however, as this study was based on one of the ELGs- Health and self-care so only those outcomes are listed below:

- 24-36 months- Children can communicate their physical needs for things such as food and drink and can let adults know when they are uncomfortable.

- 24-36 months-Children can recognise and express their own need for food, exercise, the toilet, rest and sleep.

- Assessment for proposed ELGs (36-60 months):
  - Emerging-Children can tell adults when they are hungry or tired or when they want to rest or play.

  - Expected- Children know the importance for good health of physical exercise and a healthy diet and can talk about ways to keep healthy and safe.

  - Exceeding- Children know about, and can make, healthy choices in relation to healthy eating and exercise.

The outcomes suggested in the guidelines and review provide an understanding of the level of nutrition knowledge that could be expected in an early years child. The children age range between 3 years to 5 years during which the assessment outcomes were proposed could suggest that the children should be provided the learning environment to develop the knowledge and be able to talk about healthy diet as expected by the end of the foundation stage. This research explored if these healthcare outcomes were achieved using the three main characteristics of effective teaching and learning as guided in the EYFS, as mentioned earlier the three characteristics were playing and exploring-engagement, active learning- motivation, and creating and thinking critically. After summarising this section, the methods used in developing research instruments are explained in the following methodology chapters.

Summary

WHO influenced the health promotion policies in many countries, the empowerment approach led to health education programmes. Nutrition education was included as a part of health promotion since 1970's in the UK; this was when the food habits had changed drastically, and the focus shifted in developed countries from under-nutrition to malnutrition. Diet-related illnesses raise in the last century had forced the government to make many policies regarding diet and nutrition education programmes had become a crucial means to improve public knowledge. As research supported early intervention had a positive impact, nutrition to school children had become an important area in health promotion policies. Over years various policies were developed and nutrition education was encouraged in the curriculum. In early years education, nutrition education was promoted through EYFS framework. The key aspect in one of the prime areas indicated children should understand about a healthy diet.

Chapter 3. Research questions and Research plan

The methodology in this thesis is discussed in four chapters; the first chapter explains research questions and research methods used to collect data. The next two chapters are set out to explain the two phases of data collection and the final chapter explains the data analysis techniques adopted and sample demographics. This first chapter of the four methodology chapters has three sections the first section is about research questions formulation, the second section is about the methods adopted to find answers to the formulated research questions and in the third section the ethical concerns are discussed.

The National Institute for Health and Care Excellence (NICE) (2008) recommended for researchers and policy-makers to assess and recognize the right approach to increase the nutritional knowledge of children. As set out in Literature Review (chapter 2) nutrition education through intervention studies was an effective tool in tackling nutrition-related problems. But there was no evidence of it being implemented in educational settings on regular basis. The EYFS framework has been highlighting the importance of nutrition education but there was no research as an evidence of its implementation in enhancing children's nutrition knowledge. This research was an attempt made to find the evidence real-time situation of nutrition education in early years in England which could not only serve as an evidence base for EYFS- Healthcare aspect implementation but also aid in developing nutritional approaches.

The research questions were formulated based on observations in two local early years settings and my experience as an early years practitioner. I visited two local early years

settings in York to gain first-hand knowledge of how the early years settings function on a day-to-day basis. The type of settings visited were a day-care centre and a term time nursery attached to a state-maintained primary school. The settings operational similarities and differences helped me not only to develop the research questions but also to choose research methods which could be applicable in the diverse early years settings in England. The applicability of research methods across the settings was important as it provided uniformity in the collected data. The two-day observations at each early years setting, and my experience were used to develop the research questions in relation to nutrition education in early years.

3.1. Development of Research questions

To study the current nutritional education, this study not only needed to know the extent of nutrition knowledge children gained in the settings but also the learning experiences and the views of early year professionals. The overall picture might be drawn from all these aspects, so the research questions formulated also focused on understanding the practitioners' viewpoint about nutrition education in early years, practitioners' preparation in developing nutritional lesson plans, implementation of nutrition education and its success, and methods adopted by practitioners to evaluate the efficiency.

The formulated research questions (RQ) were listed below along with the reasons. For each RQ these questions were answered: what information was expected to be collected, why was it included in the study, where or when could it be utilized and how the information was collected.

RQ1. ‘How do early year providers conceive their role in nutritional education?’

The focus of the first question in this research was on the views of early years practitioners about nutrition education in early years and also an umbrella question to capture the practicalities faced by practitioners to implement nutrition education. The nutrition education in early years depends on the discernments of the practitioners according to the studies reviewed in Literature Review under the section- factors influencing nutrition education (section 2.1.3) so to understand their viewpoint is important to interpret the condition of nutritional education. The answer to this question could be utilised to develop either future training programmes for the practitioners or other needed support resources for implementing nutrition education. The relevant data were collected in two phases by using an online questionnaire (as discussed in section 4.1) and semi-structured interviews (as explained in section 5.1.1.).

RQ2. ‘How much discussion about nutritional education takes place among the staff at the settings? What are the effects of such activities?’

This question was to understand the overall planning behind implementing nutrition education and to identify the cooperation between staff members in executing it especially between the management and the practitioners. My observations at the settings revealed that the activities were planned together by staff members and the effects were discussed in the staff meetings. Studies also revealed that nutrition education as a holistic approach could be influenced by institute’s policy and staff attitudes (as discussed in section 2.1.3). This might provide the evidence to evaluate if relevant training was needed to plan and execute nutrition education and also if the further intervention of public policy is needed to improve institutes’ nutritional education

policy. Semi-structured interviews at the selected sample settings were used to find an answer for this research question along with the online questionnaire.

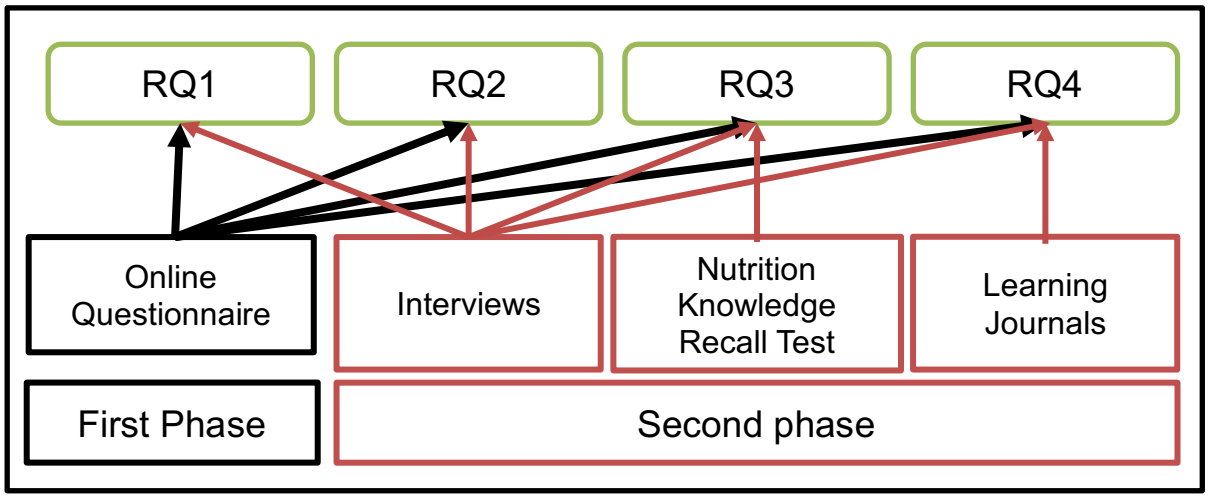
RQ3. ‘What teaching and learning techniques are used to promote nutritional education? How successful are they?’

The third question was aimed at developing an understanding about various opportunities available to create a nutrition learning experience and to know the teaching techniques used to make the learning experience efficient. In this research, the learning experiences to be effective meant aiding children in acquiring nutritional knowledge. This question was included as the studies reviewed (as discussed in section 2.1.2) revealed there were many teaching methods in nutrition education and also various resources which could be utilised to promote nutritional knowledge in children. These studies also indicated children’s cognitive abilities in developing nutrition knowledge, however, the aim of this RQ was not to measure the level of children’s understanding but to capture the source of the knowledge. So, through this question, the teaching techniques and resources utilised were investigated along with the source of children’s nutrition knowledge. All this information could be applied to develop the nutrition education programmes for children and training programmes for practitioners and also the coordination between research and practice. The learning and teaching experiences were uncovered by interviews as well as the online questionnaire. The influence of learning on children’s nutrition knowledge was known by conducting nutrition knowledge recall test for children; the recall method was used, as the aim of nutrition test was not only to establish the level of children’s knowledge but also to capture the source of the knowledge. (as explained in section 5.1.2.).

RQ4. 'How do providers use assessment to inform their approaches to nutrition education?'

The practitioners' evaluation techniques were aimed to be captured in this question and also to understand the importance given to nutrition education in the regular observations made as apart of children's overall development. The learning process for a child to be continuous and consistent observing and recording learning experiences is an important practice which I observed in the settings and also promoted by the EYFS guidelines for assessment. This could provide the actual evidence base for the nutrition education implementation in the settings and also the level of understanding children exhibits regarding nutrition education which in turn could be utilised in developing appropriate nutrition educational measures. The responses for this research question were found by examining children's individual 'Learning Journals' along with the practitioners' responses for the relevant questions in interview and online questionnaire. Learning journals (section 5.1.3) along with other tools: Online Questionnaire (section 4.1.), Interviews (section 5.1.1), Nutrition Knowledge Recall test (section 5.1.2) used to answer these questions were discussed in detail in Chapters 4 and 5.

Figure 3.1. Research questions and their relationship with data collection methods.



Based on the formulated research questions various research methods were explored and the research design was developed. The research questions were interdependent, so the research methods adopted were also interrelated. Figure 3.1 shows the relationship between the research questions and data collection methods. The following section explains the research design.

3.2. Research plan

The research methods adopted for this research were both qualitative and quantitative methods this decision was taken after deliberating about various methods. The pragmatic approach adopted was found to be more suited in finding answers for my research questions. Pragmatism was defined as “a deconstructive paradigm that… focuses… on ‘what works’ as the truth regarding the research questions under investigation” (Tashakkori & Teddlie, 2009, p. 342). And it was further mentioned that pragmatism does not adhere to the paradigm choices but suggests on adopting mixed methods in research.

Mixed methods approach provides the flexibility to draw on the advantages of both quantitative and qualitative methods. This approach was considered most appropriate for my research and for data analysis grounded theory (as explained in chapter 6) was deemed appropriate.

Mixed methods design was defined as

> A mixed methods study involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research. (Creswell, Clark, Gutmann, & Hanson, 2003, p. 212).

In this research both the methods were important in collecting data and drawing inferences for the research questions. As explained by Greene and Caracelli (2003), in their chapter on ‘Making paradigmatic sense of mixed methods practice’, any single method could not do justice in interpreting a programme’s success or failure, as there could be multiple level mechanisms involved and realistic evaluation report could be developed only after considering both views and facts. This explanation pertinently suits my research, as the purpose of the research was to evaluate the nutrition education delivery programme in early years settings.

The mixed methods research was conducted in two phases. The first phase consisted of an online survey and the second phase included interviews with practitioners and management and also short interaction with children. The first phase was conducted online to reach a wider number of early years practitioners and collect their views. In the second phase, the focus was on collecting in-depth data about the prominent views emerged from the first phase data and knowing the effect on children’s nutrition knowledge through nutrition knowledge recall test. “Mixed method data collection strategies were those that were explicitly designed to combine elements of one method with elements of other methods either in a sequential or simultaneous manner.” (Axinn & Pearce, 2006, p. 1). The data collection methodologies interrelated in this research. Embracing grounded theory in data analysis also had an influence on the data collection procedure, the concepts which emerged from the first phase data analysis were further investigated in the second phase. The concepts of online survey analysis provided the basis for developing the second phase research tools: Interview questionnaire and nutritional knowledge test.

This tool development procedure also could be associated with one of the five purposes of mixed methods research design- 'development'. Greene, Caracelli, and Graham (1989) suggested there were five purposes for adopting mixed methods. They were:

- Triangulation- verification and unification of results from various methods.
- Complementarity-one method enhances or clarifies the results from another.
- Development-results from one method are used in development of other method tools.
- Initiation- results from different methods were analysed in a different perspective to discover contradictions and paradox.
- Expansion- increases the range and breadth of an inquiry by using different methods for different components.

Other than 'development' purpose, triangulation and complementarity purposes were also relevant in this study. Online survey provided a broader view of the nutrition education practices and views of early years practitioners. Semi-structured interviews gave an in-depth insight into the practicalities in the implementation of nutrition education and practitioners' attitudes influence on it and the potency was understood by nutrition knowledge recall tests.

The analysis plan for this research was to use the descriptive statistics for quantitative data analysis. Frequencies and percentages were used to represent the sample size and responses and bar charts were mostly used to visualise the discrete sample distribution. Pie charts were used to represent each category's proportion in the whole sample, they were especially used to represent the type of early years participated in the research, sample IDACI decile representation, and also to compare the proportion of surveyed practitioners' years of experience. SPSS 24 was used to analyse the data. And Tableau Public was used to represent the sample distribution in maps.

The research was conducted in two phases as mentioned earlier each phase had its own tools, sample and method of implementation. Table 3.1 provides a summarized glimpse of the two phases methodology. Research tools development, sample selection, pilot study and main study implementation are discussed in next two chapters as First phase and Second phase methodologies.

Table 3.1. Summary of methodology

	First phase data collection	Second phase data collection
Purpose	RQ1, RQ2, RQ3 and RQ4	RQ1, RQ2, RQ3 and RQ4
Sample selection method	Multi-stage cluster sampling & Snowball sampling.	A purposive sampling method was used.
Sample size	As many as possible (N=276 valid responses received).	Anticipated 32 settings (N=15 sample settings participated).
Participants	Early years practitioners	Practitioners working with 3-5 years old children. Manager of the setting Children aged between 3-5 years.
Research Instrument	Questionnaire	Semi-structured Interviews - early years practitioners and manager Knowledge recall test- children (3-5 years) Learning journals of children.
Type of questions	Closed and Open-ended questions	Semi-structured interviews with open ended questions. Children –picture sorting games and open-ended questions.
Mode	Online survey	Face to face in the settings
Material used	Google forms	Voice recordings and field notes. Learning journal snap shots. Picture cards and field notes.
Contact method	Emails, Twitter, Facebook group posts and personal messages.	Email correspondence.
Ethics	Approval from Education Ethics Committee	Approval from Education Ethics Committee, DBS check.
Types of participant consent taken as part of ethics.	Consent was compulsory to participate in the online survey.	Consent forms from the Head of the institute. Consent form from every participating member of staff. Consent forms from parent/guardian of the participating child with request to explain it to the child and confirm child's willingness to participate.

3.3. Ethical matters

The ethical concerns for this research were about the procedure in which the data were collected and stored. The research as explained in the previous section was conducted in two phases. The department ethics approval was taken separately for the two phases, for first phase on 19thDecember 2014 and for the second phase on 26thJune 2015.

The data were anonymised as soon as practically possible and were stored in locked condition both physically and digitally with only me having the access. After completion of the data entry for analysis and as the date indicated in the consent forms all the collected paper material were shredded and personal information from online material was also deleted. By the time General Data Protection Regulation (GDPR) came into regulation in 2016, most of my collected data was anonymised, however the procedures followed would have complied with the regulations. The procedure in which ethical consent was taken from practitioners varied for the two phases as explained in the next two sections.

3.3.1. First-phase

Ethics is about respecting the participants (Angle, 2006, p. 25) and the main concern of this phase was participants to provide informed consent. “I agree and give my consent” button choice, which was included below the participant consent form in the web questionnaire, was considered as the consent signature from the participants. Without agreeing to the consent participants did not have access to the questionnaire. The consent form (as shown in Appendix 1) informed the participants they would remain anonymous from the time of collection unless volunteered for further participation and for this reason submitted data couldn’t be withdrawn. My promise to the participants

was that the data would be utilised only for academic and research purposes and also no one except me would have access to the data unless anonymised.

3.3.2. Second Phase

The second phase ethical requirement was at two levels. The first was developing the research tool and the second was while collecting the data. A social media platform was utilised to develop one of the research tools, as explained in section 5.1.2, and the consent of the participants was taken by pinning the consent information at the start of discussion thread that if they write anything on the thread the researcher would consider as, 'the consent was given to use the information', however, it would be utilised anonymously.

The ethical concerns with the second phase data collection were protecting the identity of participated institute along with associated participants both adults and children and representing their views with informed consent. All the necessary consent forms were emailed to the head of the institute along with the plan of the study. The data collection involved a 10-minute interview with one of the managerial staffs, a 10-minute interview with all the staff members involved with 3- 5 years children, sorting games with children (3-5 years) and questions with regard to the games and going through the learning journals of the children who participated. The consent form taken from the head of the institute included permission to use their premises during a working day for research data collection (as shown in Appendices 6 and 7). All the consent forms informed the participants' right to withdraw before the data were anonymised and a promise that only anonymised data would be utilised and only, I will have access to the data before anonymised. The practitioners' consent was taken after a briefing from the head of the institute (as shown in Appendix 8). The parental consent forms were accompanied with

a covering letter explaining the purpose of the data and what to expect on the day of data collection (as shown in Appendices 9 & 10). If the setting had raised any concerns, a briefing section was arranged in the participating setting to inform them about the research and answer any questions and concerns of the participants. Participants' and children's parents' consent were taken as approved by the Department of Education ethical committee. Parents' consent form included an extra column to confirm the participating child was explained about the study and they confirm that the child has chosen to participate in the study. This was included to protect the child's 'right to choose'. The ethical concern raised during data collection was when the children wanted to participate voluntarily on seeing other children participate in which case the data were collected anonymously in presence of the practitioner and when possible the interaction of questions and answers was carried out by the practitioner. And a note was left to parents informing their children had voluntarily participated in the study.

Disclosure and Barring Service (DBS) enhanced check was taken up by me according to the law requirements in England to work with children or vulnerable adults. This was also mentioned in all the consent forms.

Chapter 4.First phase- methodology

As the study was based on the Early Years Foundation Stage framework, which was statutory in England, the first phase of research was focused on establishing the broader perspective of early years practitioners across England. The sections of this chapter outline the choice of the research tool and its development, ethical matters, pilot study, and sample approach for the main study.

4.1. Online questionnaire

An online survey was selected as the research technique to reach a large number of sample and collect practitioner's view and information in relation to nutrition education. This online survey was developed in questionnaire form, which contained both open-ended and close-ended questions. 'Google forms' was used as the online platform for developing the questionnaire and also accepting the responses. The next two sections explain why this particular tool and how it was developed.

4.1.1. Tool choice

Online administered questionnaire's main purpose was to reach a wider range of practitioners. In England, the early years settings are not only diverse geographically and economically but also diverse in the type of settings; reaching the wider population might facilitate in capturing the overall picture rather than the confined one. Convenience for practitioners was the other purpose of the self-administered questionnaire, in other terms self-completion questionnaire, as it provides the flexibility to complete in their own time, in their natural environment and at their own speed. The absence of interviewer could also result in practitioners' views which were not

influenced by social desirability bias (Bryman, 2016, p. 222). Social desirability bias is the tendency of the respondent answering in more socially favourable manner.

Web survey had added advantages which were beneficial in my study. Customised appearance and the number of questions on screen at a time could be controlled in web survey making it more engaging to the respondents. The response-based linking to the next question (filter questions) provided an opportunity to streamline the responses. The compulsory answer option wouldn't allow the participants to skip the questions which was one of the disadvantages in paper format, however, in this questionnaire the usage of compulsion was minimum to provide a voluntary choice for the practitioners. Embedding feature of the web survey was very useful for the ease of distribution in various web-platforms, as explained in the 'sample approach for Online questionnaire' (section 4.4.), made it economical both timewise and moneywise. Practitioners' responses could be collected in the linked datasheet which provided an opportunity to monitor the response rate regularly and this reduced wait time to know the comeback gave an opportunity to take necessary steps to improve the number of responses. It was also ideal for the grounded theory analysis method adopted to look into emerging themes and regrouping them.

'Google forms' was used to develop the web questionnaire. This platform was chosen due to the familiarity with the web platform, ease of use and was also economical as the university-sanctioned it. The following section explains what was included in the questionnaire and why.

4.1.2. Questionnaire development

The self-developed questionnaire was a combination of open-ended and close-ended questions and consisted 22 questions. The first question was related to the consent form and it was a compulsory filter question which allowed participants to participate in the survey only with an affirmative response. The other questions were designed and organised in the form to capture the essential information of the practitioners' background in relation to the profession and also their views and practices relevant to nutrition education. The original format of questions and their sequential order used for data collection can be viewed in Appendix 1 'Early years practitioner's questionnaire'.

The questions enquiring about the background of the practitioner focused on capturing the information like type of the institute, the location of the institute, practitioner's qualification, the experience of the practitioner, the self-confidence level in dealing the topic and also about the training in dealing with nutrition education in early years. Knowing the type of institute was crucial to understand if there was any variation in delivering nutrition education with the type of settings. According to Bryson, Kazimirski, and Southwood (2006, p. 18) in England childcare was provided by number of formal organisations, which were :Nursery school - term time only maintained by local authority; Nursery class- attached to primary or infants' school; Reception class- attached to primary or infants' school; Special day school or nursery or unit; Day nursery; Playgroup or pre-school; Childminder; Nanny or au pair- Babysitter who came to home. All of these types of settings were categorised into four types of settings for this research purpose. The nature of the setting was considered to categorise them. Term-time only nurseries or playgroups, full-time nurseries, reception classes and childminders were the four categories into which they were categorised. The settings

catering special needs were not included in the research as the nutritional education in these settings cannot be generalised. The close-ended question included four choices with an ‘other’ option to write in the type of setting.

The location of setting was known by asking the first half of the postcode which was later used in data analysis to capture the area demographics. Only collecting the first half provided the participant to keep the institute in which they work anonymous. The practitioners’ qualifications, years of experience and the training acquired provided an opportunity to explore if there was a relationship between these factors and how nutrition education was delivered at early years settings and also on their confidence levels. However, these questions were not clustered together but positioned across the questionnaire aiding in both the purposes: the flow of questions and not to daunt the respondent.

The views of the practitioner were captured on what topics must be included in nutrition education in early years and ways to evaluate children’s nutrition knowledge. These were open-ended questions asking the practitioner to mention five important topics and the questions they would ask children to evaluate nutrition knowledge. The questions in the questionnaire were also designed to understand the opportunities available in day-to-day activities in the setting and to understand the practice in the settings the questions asked were based on the frequency of nutrition education, recording observations related to nutrition education and its influence. Opportunities to teach nutrition education were explored through indirect questions such as ‘if children had food at settings’ and ‘what types of foods they had at settings. Questions were also formatted to know the enthusiasm of children felt by the practitioners and the

appropriate age for a child to start nutrition education according to the practitioner and if any hindering factors in implementing the practitioner's plans in relation to nutrition education. All these questions were included as these might aid in understanding the attitudes of practitioners.

The questionnaire did not include any personal information to reveal their identity unless the participants volunteered for further participation in the research. Hence, the data were anonymous from point of collection and it was collected in an Excel spreadsheet linked to the online questionnaire. In case, the participant volunteered their working address and email were collected for communication purpose. The participants were requested to volunteer for ten-minute face-to-face or telephonic interview.

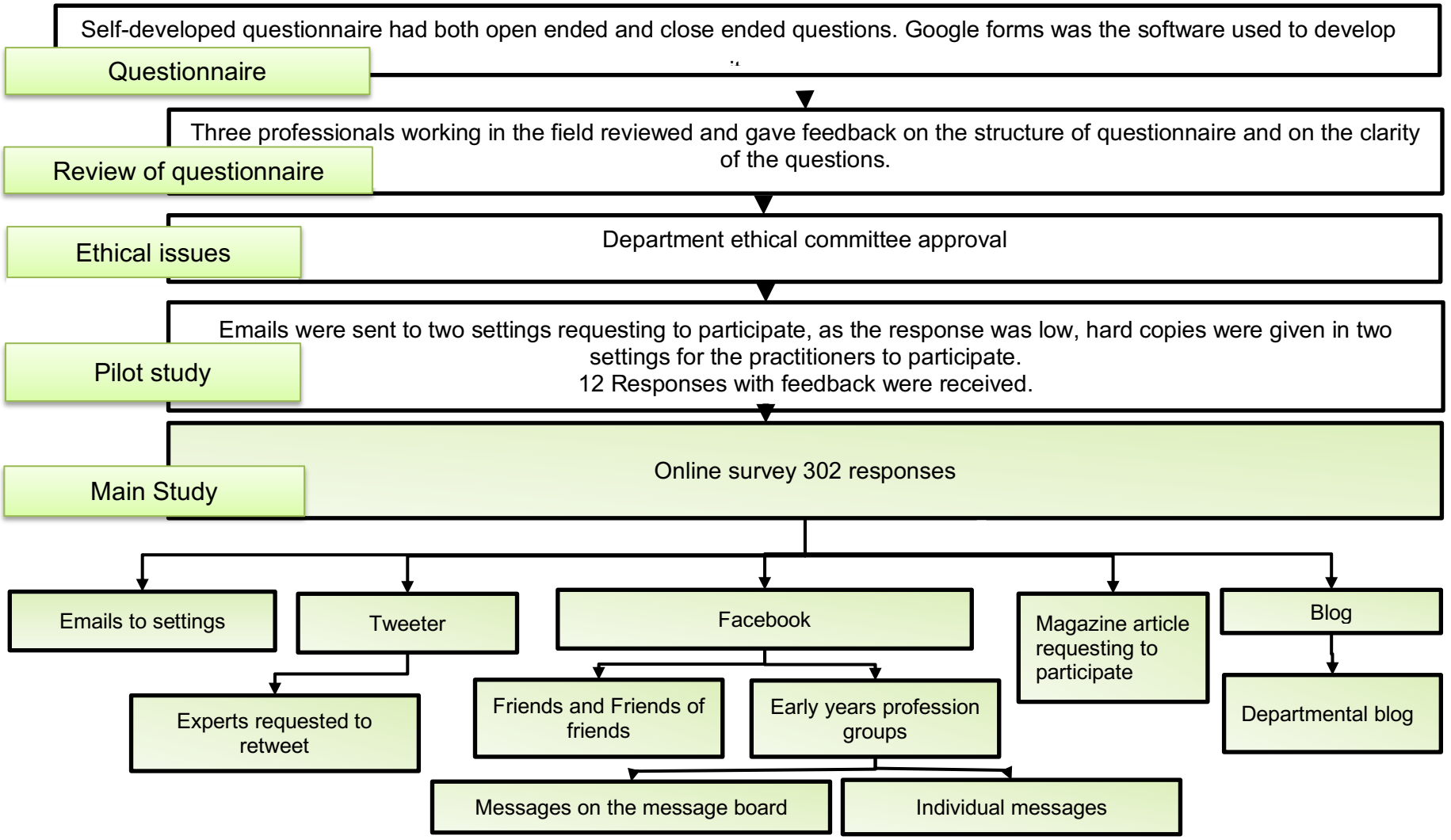
4.2. Pilot study

This self-developed questionnaire was reviewed by a deputy headteacher of a nursery-linked primary school and two independent early years practitioners individually. Based on their feedback the sentence structure of some of the questions and the sequential order of a few questions were modified. This review helped to make the questionnaire participant friendly with simple wording, straightforward and concise.

The pilot study was conducted by emailing the updated online survey to chosen early years settings requesting to complete the survey. A short feedback form was also included which had three questions to share their views about: understanding of the questions, did they have any other relevant information and time taken to complete the survey. As the response was low printouts of the questionnaires were given to practitioners in two early years settings to capture their views. The responses were then entered into the online format. The pilot study had total 12 responses that were used to

evaluate the questionnaire and its structure. The purpose of the study was to refine the research tool, however, as there were no feedback setbacks and the questions were finalized for the main study. Table 4.1 represents the first phase methodology with sample approach methods. The time to complete the questionnaire was recorded as 10 minutes on average which was utilised in making participation requests for the main study.

Table 4.1. First phase methodology



4.3. Sample approach for Online questionnaire

After the pilot study, the questionnaire was active online and captured responses for three months. The responses were captured through excel spread sheet which was automatically assigned through Google forms (used for tool development). The data collection was anonymous from the time of collection and it was completely voluntary without any incentives. The timeline for collection of data were from March-May 2015. A deadline was set to receive the responses as the second phase research tool development and the data collection was dependent on the online survey responses. There was no target sample size or sample restrictions other than that the participants should be working in early years settings in England. Random sampling and snowball sampling techniques were adopted initially to contact the participants and later multistage cluster sampling techniques was also adopted to increase the responses.

Random sampling technique is a basic sampling technique, where every member of the targeted sample has an equal chance of being chosen (Bryman, 2016, p. 176). However, a random sample for this study was drawn from the practitioners who worked in institutes which had web-presence. The email addresses of early years settings were collected randomly from websites or databases such as daynuruseries.co.uk, university linked nurseries, local councils. I used a self-designed computer program (python) to randomly pick alphabets and all the early years settings in England that started with the selected alphabet listed in the selected databases were emailed requesting to forward to their practitioners. The questionnaire link embedded in the email was sent to various early years settings across England requesting to forward to their staff members as a way to reach the targeted population of early years practitioners. Although I contacted more than 2000 settings through emails, received only 15 responses, after waiting for

a month, alternative methods were explored to increase the responses. This decision was taken as practitioners could not be approached directly through this method and assuming that it could be the hindering factor.

A blog, http://earlyyearsnutrition.blogspot.co.uk, was written for research purpose stating the importance of nutrition education early years and a link was embedded to participate in the survey. The blog was developed especially for twitter purpose, as this social networking site limited the number of words in a tweet. Twitter account was developed only for the research purpose and was following eminent personalities in early years field. I tweeted with the blog link to participate and also requested experts in the field of early years education to re-tweet to reach wider account users, expecting a snowball sampling scenario. Snowball sampling is a technique where the research initially makes contact with a group of people related to the topic and then they refer further (Bryman, 2016, p. 188). A similar effort in snowball sampling was made by writing an article on the University of York, Department of education blog requesting fellow students and other staff members to forward the link to practitioners. All these efforts did not increase the number of responses so social networking site Facebook was also used in a similar way through friends and friends of friends as an attempt to approach the practitioners directly. The snowball technique did not work in this research and one of the main reasons could be due to lack of direct contact with the practitioners. Various magazines featuring childcare or early years were approached to publish the article to reach their subscribers. An article was published in ‘Home child carer’ in May/June 2014 issue but as the process took longer than expected the deadline for the collection was reached by the time magazine was released. However, there was only one email expressing interest to participate in the study.

Multistage cluster sampling technique was used on Facebook. Multistage cluster sampling involves multiple stages in sample selection initially cluster of representative samples were selected and then from the selected cluster individual samples were selected (Nyasulu, 2014). The random selection of clusters and the final sample could be done in many stages as the name suggests, but for this study two-stage cluster sampling was adopted. The special groups of early years practitioners were identified on the Facebook and those based in the UK were approached to permit to join as most of these were closed groups. Once permission was granted to enter the group messages were posted. A childminder group and an early years group were selected randomly, and the members were contacted through individual messages. The response rate was low to all the above approaches. The low response rate in Facebook approaches could be due to the settings such as the sent messages reach a separate inbox unless a friend to the contacted person sends it and these messages display depends on individual preference settings, similarly, the group messages could be pinned only by the administrator of the group. Though the response to individual messages was also low, the higher volume of the members approached (6000) resulted in 302 responses. The data analysis techniques adopted, and sample demographics are discussed in Chapter 6.

In the next chapter, second phase research tools and structure are explained which were developed based on the data analysis of first phase data.

Chapter 5. Second Phase-methodology

The aim of this research was to know the real-time scenario of nutrition education in early years settings in England. An online survey was conducted in first phase data collection, which aided in understanding the broader overview of the nutrition education across the country. The second phase was aimed at developing an in-depth understanding about the early years nutrition education situation. Data collection process in this phase involved conducting interviews and nutrition knowledge recall tests at the sample settings. The following sections consist of information about research instrument development, sample selection, ethical concerns, pilot study and the main study.

5.1 Research tools

The techniques adopted for second phase data collection were semi-structured interviews for both practitioners and managers; children's nutrition knowledge recall tests and also going through children's learning journals. The online survey preliminary data analysis helped in developing the tools and structure of second phase data collection. Consequently, two interview questionnaire structures, nutrition knowledge recall test structure and format to observe 'Learning Journal' records were developed. The three sections explain why these techniques were chosen and how the tools were developed.

5.1.1. Interviews

In this second phase data collection, face-to-face interview method was adopted with open-ended questions. Kvale (1983) defines the qualitative research interview as "an interview, whose purpose was to gather descriptions of the life-world of the interviewee

with respect to interpretation of the meaning of the described phenomena". The data collected from early years practitioners and managers through these interviews contributed to answer the four research questions.

5.1.1.1. Tool choice

The perspective of early years practitioners and managers with regard to nutrition education and their practices were captured through face-to-face interviews in the second phase that might help in developing concepts along with the first phase data. The advantages of face-to-face interview method were that answers would be spontaneous, and the communication would be synchronous between the interviewer and interviewee (Opdenakker, 2006). As the interviews were organised on one to one basis without any external influence or intrusion, the views shared reflected the individuals' contemplations. The semi-structured interviews structure provided the flexibility to vary the sequence of questions and structure of the question which aided in making it a more personalised approach than the structured interviews question and answer section. This approach also provided an opportunity to nudge further into an answer to get a clearer understanding about the situation.

All the questions included in the interview were open-ended questions as they added valuable outlook in this research; unlike close-ended questions, open-ended questions provided the freedom to the respondents to express in their own words. This way of expression provided an opportunity to include examples from their experiences which added an extra level to understand the situation. The following section explains what was included in the questionnaire and why.

5.1.1.2. Interview questions development

An Office for standards in education (Ofsted) (2004) report stated that settings varied considerably in the effectiveness with which they implemented their food policies; a number of factors impeded settings from making good progress in providing effective nutrition education. The factors impeding early years settings in implementing nutrition education and how they vary between the settings were important for this research and to capture this information interviews with early years practitioners were conducted using open-ended questions with the help of an interview outline. Ofsted (2004) also mentioned of the early years settings and schools visited, the minority that were the most successful in developing and embedding children's understanding of food and nutrition were those where the senior managers had a clear strategy for fitting it into the curriculum. The 10-minute interviews targeted at the managerial staff was to understand the institute's policy regarding nutrition education and the support and encouragement they gave to the staff to implement the topic. In single staff settings like childminders this interview was conducted using the early years practitioner interview format.

As emphasised earlier online survey data analysis served as a guide to the topics to be included in the interviews. Although both the semi-structured interview outlines were developed as fully structured questions as seen in Appendices 2 and 3 Interview templates of managers and practitioners, these were used only as a guide and were not used in an exact format in the interviews. Most of the questions included in both managerial staff interviews and early years practitioners' interviews were similar. The similarity in the topics was maintained as it would aid in analysing the topics and establishing the relationship between the staff. There were 10 questions in the

managers' interview and the only questions which differed with the practitioners' interview outlines were asking managers about their involvement in planning the nutrition education activities, and topics managers thought were important in children's nutrition education. The other questions included were similar to some of the practitioners' interview, so they were explained along with those.

There were 14 questions included in practitioners' interview the topics for the questions along with the reason for inclusion are mentioned here:

Responsibility for nutrition education- this was included to understand the attitude of practitioners, this was included as many of the online participants mentioned parents or family as hindering factors, so wanted to understand if they took the responsibility or thought it was not their responsibility.

Nutrition education – enquiring if nutrition education was a part of the curriculum was a scene setting question to know the practitioners' thoughts and also included questions such as if they knew it was a part of EYFS, if not in EYFS what and if they made nutrition-related observations. As the study was based on nutrition education, which is also one of the Early Learning Goals of the EYFS framework the practitioners and managers were asked about it. And as observations were a part of assessment in early years settings managers and practitioners were enquired about them and also the online data indicated there was inconsistency in recording observations.

Factors-The questions regarding institutes' policy, training and resources were also included, as the online data indicated that there was lack of support in terms of resources, training and also staff collaboration. The answers might not only provide an insight into the beliefs of the practitioners but also the actuality by triangulation of both the interviews with online survey data.

Ideal age to start nutrition education was included in both the interviews as this determines the professionals' approach towards early years nutrition education, although the online data indicated most of them agree early years was correct age, the practice of the vocalised view could be understood through interviews.

The other questions were framed around the implementation of nutrition education. The managers were asked about the topics and their involvement directly whereas for practitioners the questions were about learning experiences, teaching techniques, opportunities and memorable experiences. As the topics were suggested by practitioners in the online survey, the indirect questions might not only provide the way the topics were implemented but also to compare to that mentioned. Memorable incidents were asked in an attempt to capture the real-time experiences dealing with the nutrition education.

The interviews of both the managers and practitioners were ended by enquiring if there were any hindering factors to implement nutrition education and also if there was any more information they want to add regarding the topic.

The data collection during interviews was done through making notes of the key points and also audio recordings. Mock interviews were conducted with friends to establish the flow of interview and also understand the time frame to be expected for each interview. These interview templates might help in understanding the implementation of nutrition education but to understand its influence nutrition knowledge recall test was needed. The tool development is explained in next section.

5.1.2. Children's nutrition knowledge recall test

In the study, one of the research questions was "What teaching and learning techniques are used to promote nutritional education? How successful are they?"

Evaluation of children's nutrition knowledge was the way adopted to know about the efficiency of nutrition education. Along with children's understanding of nutrition knowing the source of their knowledge was very important for this research as it might act as evidence for nutrition education provided at the settings. For this purpose, a research tool and field notes template were developed which are explained in the following sections.

5.1.2.1. Tool choice

A search through literature provided different designs to assess children and no individual method served the research purpose completely. The age-appropriate research tool was planned by seeking advice from early years practitioners. An online discussion thread was opened on social media (Facebook) to acquire ideas on what technique or method was better to interact with children. The groups contacted were the same groups who responded for the first phase data collection. These were the groups of early years practitioners working across the UK.

The response for the ideas on what technique or method was better to interact with children was low: only seven responded. The ideas suggested were TASC wheel, hands-on experience with real food, using pictures or pictograms, and sorting hoops. Thinking Actively in a Social Context (TASC) wheel is an eight-step process designed by Belle Wallace in 2000 which could be used in improving children's thinking and problem-solving capabilities (Wallace, Bernardelli, Molyneux, Farrell, & Eriksson, 2012). Although this was a prominent tool, it might be time-consuming to apply to

multiple questions planned in the study - creating problem scenario for every question, going through the involved 8 step process for each question; and it also needs prior practice for both children and researcher to use it effectively, due to these practicalities this method was not adopted. Hands on experience with real food wouldn't be practical either as it would be difficult to maintain consistency across the sample settings due to the shelf life of foods and number of foods to be transported. Therefore both the techniques were not used in this research. Gorelick and Clark (1985) used realistic plastic replicas of foods in their research study but the variety of food models available in the market was limited eliminating it from my research tool choice. In this research laminated picture cards were used and also sorting games, as suggested by the online practitioners, because of the simplicity of the usage and also consistency could be maintained throughout the sample. Card sorting activities were used frequently in preschool children to measure children's categorization knowledge (Joly, Pemberton, & Griffiths, 2009; Kloo, Perner, Kerschhuber, & Dabernig, 2008). Byrd-Bredbenner, Marecic, and Bernstein (1993) used picture cards to evaluate the nutrition knowledge of children, a question was asked loud and clear and the children answered by pointing out the picture cards. A similar technique was used in this study as explained in the next section.

5.1.2.2. 'Nutrition knowledge recall test' development

'Nutrition knowledge recall test' as it was set out not only to test the knowledge of children, but children also needed to recall where they gained the knowledge. The tool was a combination of open-ended questions, sorting games with imaginary scenarios and oral history interview. Oral history interview as defined is an "unstructured interview in which the respondent was asked to recall events from his or her past and reflects on them." (Bryman, 2016, p. 694). For all the answers children could either answer orally

or show the picture cards. Apart from knowing the children's nutrition knowledge, where they acquired the knowledge was key for my research, so all the responses from the children were followed by asking how they knew it.

The research tool was developed based on the responses to a question included in the online questionnaire, which was done as a part of first phase data collection. The question was (question 20) "If you want to evaluate healthy diet knowledge in children, what questions would you ask the children?" The research tool was developed by including the topics majority of the early years practitioners suggested. For further details about the responses to question 20 please refer to the data analysis chapter (section 9.2.1.). Based on the topics appropriate laminated cards were used as the research tool, which consisted real photographs of fruits, vegetables, meat, dairy, meals, desserts, beverages, fast foods etc. The 63-piece set used was of 7cm X 10cm sized cards as listed in Appendix 5.

The topics included were recognising healthy and unhealthy foods, 'five a day', meals per day, balanced diet, portion size, care of teeth, treats per day, differentiate between treats, best drink and number of glasses of water per day. For the first topic, each child was asked to sort out the cards on the table into two groups. The suggested groups were healthy and unhealthy or 'Good for our body or not good for our body'. On completion, the child was asked on what basis they have grouped them. The child was asked if he/she can what 'Five-a-day' was. Then the child was asked to make a balanced healthy meal by placing the picture cards in an imaginary dinner plate. The size of the meal and also selection of the meal was considered for evaluation after discussing with each child about their choices. The child was also asked how to keep

teeth healthy. About treats and chocolates and how many can be taken in a day. Then the child was also asked about a healthy choice of drink and also the number of glasses of water should be taken in a day.

A field notes template was developed and used in this part of data collection to maintain reliability throughout the sample which needed only a tick mark for each question to note the responses. The field notes as shown in Appendix 4 consisted of three anticipated answers for each topic included in the research tool. The anticipated answers were concluded by using my knowledge in the subject and also research evidence as discussed with results. If children were able to give the related answer they were in the middle group and those who did not know the answer in the first one and those who had an explanation for their answer in the third category. The researcher and one of the staff member from sample setting marked the field notes independently for each child. The reliability of the tool was validated by using inter-rater reliability (IRR) (Armstrong, Gosling, Weinman, & Marteau, 1997; Hallgren, 2012) as explained in the chapter Data analysis and Sample demographics (section 6.1.2).Once the IRR was established the researcher did the evaluation individually.

5.1.3. Learning Journals

Apart from assessing the child's nutrition knowledge through the research tool, their learning journals were examined to assess the evidence of any previous observations related to nutrition education. The practitioners' recorded observations might provide evidence to the children's nutrition education assessment made by the early years providers. These observations in children's 'Learning Journals' along with the interviews and survey could contribute for the answer to the next research question, "How do providers use assessment to inform their approaches to nutrition education?"

Learning journals are the records of observations maintained by the early years providers for each child. These learning journals help in understanding the development of every individual child (Pierson, Bronson, Dromey, & Swartz, 1983; Siraj-Blatchford, Muttock, Sylva, Gilden, & Bell, 2002). And a common practice in the early years settings of England to monitor the progress of child's development which is maintained by the practitioner-in-charge of the child, known as key practitioner, with the inputs from other practitioners and parents. The EYFS profile assessment procedures are generally in three forms:

- Day-to day formative assessment- the ongoing progress to inform teaching and planning
- In-setting summative assessment-End of period child's performance understanding
- National statutory summative assessment- child's performance in relation to national comparisons and expectations.

Observational assessment is used by the practitioners to develop the day-to-day formative assessment. Practitioners' observations contribute in developing the reliable and accurate picture of children's learning and development (Standards and Testing Agency (STA), 2016b). The observations based on everyday activities where children demonstrate their skills, understanding and specific knowledge are recorded by the practitioner in the learning journals. So, these learning journals could be used to not only inform parents about their children's progress but also could be used by the practitioners to provide the evidence of child's attainment in the learning area.

Therefore, the practitioners might include observations regarding a learning area; mapping to its primary area or ELG of the EYFS in the learning journals as part of the day-to-day formative assessment for every child. Therefore, the learning journals with the observations made regarding nutrition knowledge and any future plans included,

provides an insight about not only the nutrition education status but also if it is being associated to the EYFS. The frequency at which they were recorded also might provide an insight into both the rate of progress of the child and also how much initiative was being taken at the settings to provide it. The analysis could be done using the thematic approach and as a complement to the other research tools suggested in analysing dairies by Bryman (2016, p. 547)

Learning journals access in many of the settings was restricted, however, research evidence to what kind of observations were recorded and how frequently they were made was collected through direct and indirect questions included both in online questionnaire and interviews.

The research tools were developed, and their utilisation was determined through pilot study (section 5.4). The other main task was to select the sample settings which is explained in the next section.

5.2 Sample selection process

Although the initial plan was to utilise the volunteers from the online survey as the second phase sample, the low affirmative responses led to a selection of the purposive sample. Purposive sampling is an organised selection of participants that were relevant to the research interests and those who could provide alternative views (Bryman, 2016, p. 408). The possible variables were identified for purposive sample selection based on the literature review as explained in next section.

5.2.1. Identification of variables

The first phase online questionnaire included a request to volunteer for the further in-depth study, but there were only 10 willing responses and on further contact, the respondents were unable to confirm their readiness. Therefore, the purposive sampling technique was used to select the sample of early years settings based on the identified variables. The variables were identified based on literature review and to certain extent the first phase data.

The variables identified were based on those that affect nutritional status and food choices as they could also affect the implementation and success of nutrition education. While care was taken to consider all the possible variables, the practicality of conducting research was not ignored. The variables which were considered in selecting the sample were deprivation, ethnic background, population distribution, geographical regions and type of settings as summarised in table 5.1 and explained in following sections.

5.2.1.1. Deprivation indicators

Household income plays a major role in the nutritional status of the children in the family. In an article by Centre for Economics and Business Research (Cebr) (2014, p. 14) the health survey in England reveals that a higher proportion of children from poorer households were obese than their counterparts in higher-income households. This might increase the risk of weight-related disease and health problems for these children. Hence, deprivation along with household income and associated factors was selected as one of the variables. According to Office of National Statistics (ONS) (2015), the average Gross Disposable Household Income (GDHI) for England is £17,842 per head and in England, 16.5% of children were eligible for free school meals

which was another indicator of deprivation (Department for Education (DfE), 2015). The areas based on average household incomes could be identified based on the Regional GDHI Office for National statistics report -Disposable income per head in local areas, (ONS, 2015) and also by the number of children eligible for free school meals in the local area (DfE, 2015). However, the Income Deprivation Affecting Children Index (IDACI) had provided information for selection of the areas. The possible variables above 50% and below 50% decile (decile means each of ten equal groups into which a population can be divided according to the distribution of values of a particular variable) were considered for the sample selection as explained along with selected areas (section 5.2.1.4).

5.2.1.2. Ethnic background

Ethnic background was found to play a key role in implementing nutrition education as food habits were dictated by cultural backgrounds (Dovey, Staples, Gibson, & Halford, 2008; Freedman & Alvarez, 2010). Studies indicate that the lifestyle related diseases such as obesity, cardiovascular disease and diabetes are highly prevalent in certain ethnic populations; as these diseases could be linked to diet and lifestyle habits, nutritional interventions could help in managing them. However, studies also emphasise that nutritional interventions were effective only if the programmes were culturally appropriate. (Donin et al., 2010; Landman; & Cruickshank, 2001; McKeigue, Adelstein, & Lancet, 1985; Szczepura, 2011)

According to a release by the Department for Education (Drake, 2015) in state-funded primary schools 30% of pupils were classified as being of minority ethnic group. These pupils who have been classified as minority ethnic group were other than White British. Based on the State-funded primary school's reports: by local authority area and region

in England, areas with ethnic diversity above and below the national average could be selected (Department for Education (DfE), 2015).The areas were classified based on the percentage of the ethnic diversity of the area and they were classified into three categories- 0%-20% as less or no presence of ethnic groups, 20%-50% as presence of ethnic groups and 51% or more significant presence of ethnic groups. Nevertheless, for this research, the two variables of the ethnic diversity considered were above or below national average. This decision was taken due to practical reasons as the official local reports generally mentioned only above and below national average but not exact percentage.

5.2.1.3. Population distribution

The other variable considered was based on the representation of the area in statistical reports. Pateman (2011) in his report on Regional trends classified the areas of the UK into six different types based on the size of population, population concentration and remoteness. Urban – Less Sparse, Urban – Sparse, Town & Fringe – Sparse, Town & Fringe – Less Sparse, Village, Hamlet & Isolated Dwellings – Sparse, Village, Hamlet & Isolated Dwellings – Less Sparse. In this research the distribution will be considered as two variables, combining the less sparse and sparse urban areas as ‘urban’ and other town and village areas into ‘rural’. This decision to combine village and town was taken as the individual local maps provided by Office of National Statistics were only categorised as urban and rural. Children’s food choices were highly influenced by availability of food and environment (Popkin et al., 2005; Rasmussen, Krølner, & Klepp, 2006; Timperio, Ball, Roberts, & Campbell, 2008). The consumption of meat, milk, fruits and vegetables were more in rural areas whereas foods consumed in urban areas were higher in sugar content and more processed foods (Bryson et al., 2006; Kirby, Baranowski, Reynolds, & Taylor, 1995; Mazengo, Simell, Lukmanji, Shirima, & Karvetti,

1997). Therefore, to determine the influence of various facilities or lack of facilities this variable was included in this study.

5.2.1.4. Type of settings

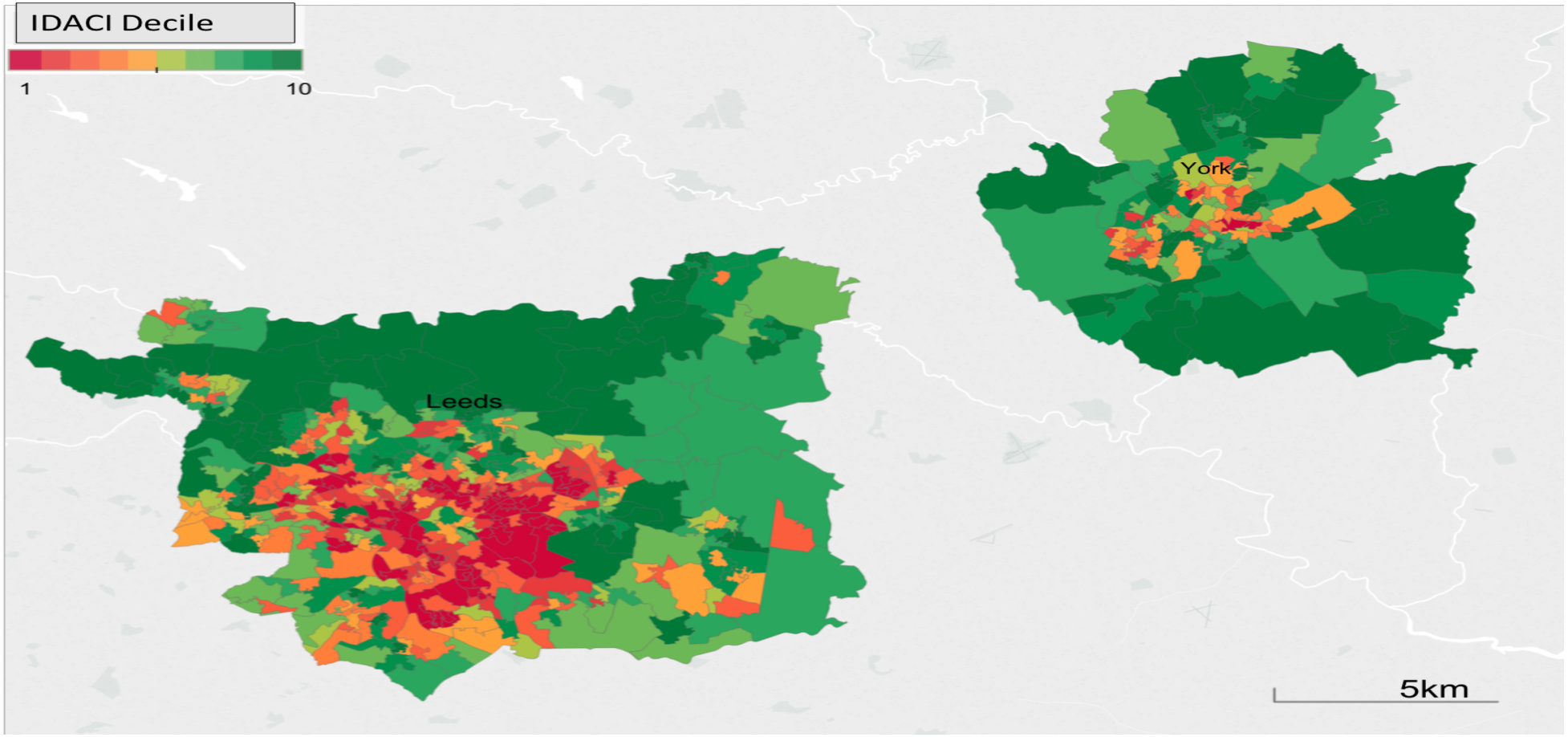
Although Bryson et al. (2006) mentioned there were many types of formal child care organisations in England all of these types of settings were sorted into four categories of settings for this research purpose, as explained in the first phase questionnaire development (section 4.1.2) and the same categories were used in the second phase also to maintain uniformity. The nature of the setting determines the way the setting is operated so the inclusion of all the four variations would provide a chance to analyse if there was any variation in implementing nutrition education.

5.2.1.5. English Regions

The online data represented all regions of England and on analysis, there was no association between the geographical areas and many of the factors associated with nutrition education as explained in discussion chapters. So, the Yorkshire and the Humber region was selected out of the nine regions of England (2011) due to the suitability factors. Yorkshire region was ideal for the research purpose due to its diversity in deprivation, ethnic diversity and population distribution (Kay, 2009), which were the selected variables in this research. Yorkshire and the Humber region was below the national average but there is diversity in household income when local areas were compared. York and Leeds were selected within the region for reasons as explained below. York and Leeds were found to be having contrasting features as well as similarities based on the online information from Office of National Statistics website (Open Government Licence (OGL), 2015). In York, household income levels were nearer to the national average at £17,663 per head and in Leeds £16,656 per head

(ONS, 2015, GDHI per head) but there was a greater variation in primary children eligible to claim free meals, in York 9% were eligible whereas in Leeds 20% children were eligible (DfE, 2015 Table8a), indicating the deprivation level variation. But when closely observed there were areas within the cities which were in contrast to the rest of the area making them an ideal choice for purposive sampling as represented in IDACI decile map of York and Leeds (Figure 5.1).Index of Multiple Deprivation (IMD) contains IDACI decile of the local regions of England where 1 is the most deprived 10% of the LSOAs [Lower-layer Super Output Areas are small areas designed to be of a similar population size] (Ministry of Housing Communities and Local Government, 2015). The contrast was also found in ethnical diversity, York (11%) was less ethnically diverse in contrast to Leeds (32%) which was ethnically diverse (Department for Education (DfE), 2015Table 9a).These two council areas included both urban and rural areas (Office for National Statistics (ONS), 2011) and were also selected for the proximity to the University of York and also for transport convenience to reach the selected sample

Figure 5.1. Leeds and York IDACI decile map



Note: Maps not to scale

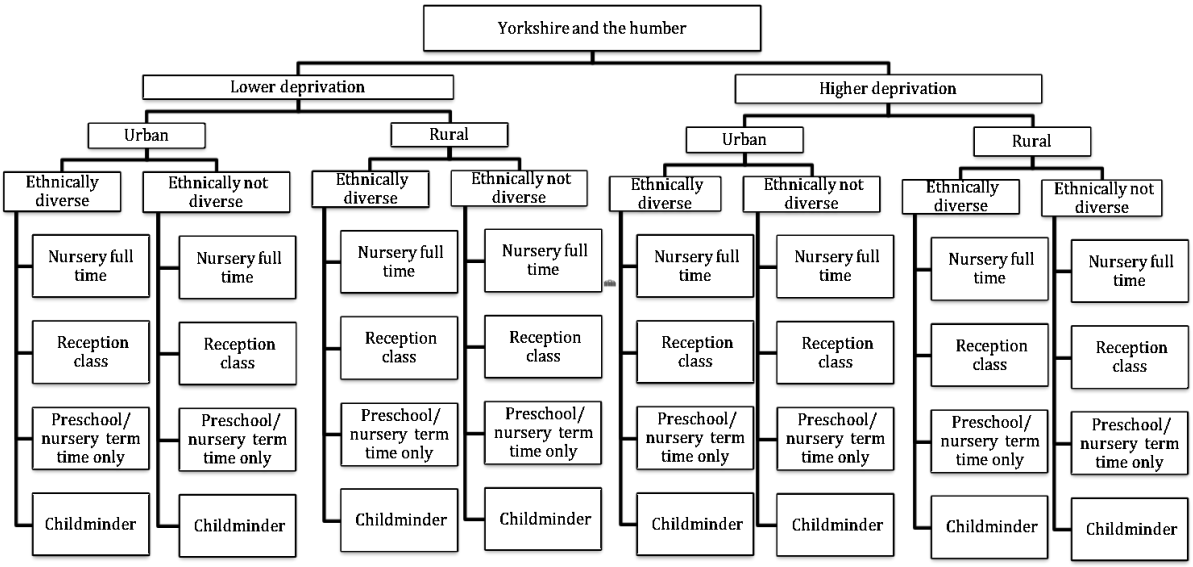
Table 5.1. Summary of Variables

Variables	Possible values								Chosen values and explanation
IDCAI Decile	Below 50%				Above 50%			2	2
Ethnic distribution	0-20% less or no presence of any other ethnic group			20-50%presence of ethnic group			51% or more significant presence of ethnic group	3	2- The ethnic diversity was generally mentioned as above or below national average
Area	Urban Less-Sparse	Urban-Sparse	Town & Fringe-Less Sparse	Town & Fringe-Sparse	Village, Hamlet or Isolated Dwellings- Less Sparse	Village, Hamlet or Isolated Dwellings-Sparse		6	2- The variables were grouped into Urban or Rural as common practice.
Types of early years settings	Nursery school - term time only maintained by local authority	Nursery class attached to primary or infants' school	Reception class attached to primary or infants' school	Special day school or nursery or unit for children with special needs	Day nursery- private run fulltime nursery	Child-minder	Nanny or au pair Babysitter who came to home	6	4- The variables were grouped into four groups.
Regions	North East	North West	Yorkshire and The Humber	South East	South West	East Midlands	West Midlands	East of England	London	9	1- Yorkshire and the Humber region was selected due to the diversity.
Total										648	32

5.2.2. Sample selection

The sample size targeted was 32 making sure at least one early year setting characterises the selected variables as represented in table 5.1. The purposive sample was selected from York and Leeds council areas. Local council websites were used to identify the available early years settings in the selected areas. In the York region, the University of York postcode was used to seek the data of various early years settings: childminder, primary school, preschool, child day-care centre, and the Leeds family information service was searched using the postcode of the University of Leeds. Each type of the early years settings contact data were collected as per the website search criteria, such as a maximum of 120 settings for Leeds and those in the radius of 25 km for York. At least 100 of each of the four types of settings in each selected council area were approached. A blanket email was used to contact all the settings in these two areas. The emails were personalised to individual settings using mail merge. The targeted sample selection is represented in the flowchart (Figure 5.1) but while contacting there was no targeted approach only after confirmation, they were categorised into the respective sample type. On receiving the confirmation from the settings to participate the ‘Sample matrix’ (as shown in table 6.2 and further explained in sample demographics section of Chapter 6) was marked, verifying the agreed early years setting area profile in various databases for the aimed variables. As there was no response from many of the settings reminder emails were sent and to capture particular category of variables all the possible efforts were made, such as meeting the head of the institutes, telephonic approach and even through known contacts. 15 settings agreed to participate in the study. Email or telephonic contact was maintained with the agreed sample settings to arrange the date of visit and also to clarify any queries or concerns regarding the study.

Figure 5.2. Sample selection flow chart



5.3 Pilot study and main study

A pilot study was conducted to assess the research tools and approaches planned and it was conducted in one of the agreed term time early years setting.

The main study was conducted in 15 settings in York and Leeds. 33 early years practitioners working with 3-5 years children and 9 managers participated in interviews. All the interviews were audio recorded to aid in transcription and I had field notes during the interview. The written notes were shown to the participant and their consent was taken to use it in the research so that their responses might not be misinterpreted in the research. The interviews with practitioners and management were conducted individually. All the interviews were audio recorded as well as notes were taken with the consent of participants. During the pilot study interviews were conducted in a corner of the room, there was still noise distraction, so care was taken where possible to conduct the interviews in a separate room.

In each setting parents were requested to give consent for their children aged between 3-5years to participate in the research, who might be present on the agreed day of data collection. 106 children interacted with me in presence of a staff member wherever possible in a small group based on pilot study experience. The pilot nutrition knowledge recall test with children was conducted in a group of seven with the help of two practitioners which created little confusion and children's attention deviated. Based on the pilot study, necessary changes were made in conducting the main research like instead of interacting with a large group, the researcher interacted with three or four children at a time as the children seemed to lose interest by the time, they got a chance to answer. The questions in the main study were asked in an imaginary approach to engage children and connecting to the previous answer where possible for example '… now, what helped to chew your food, how would you take care of your teeth; or if I gave a cake to eat and your teacher walked in not knowing you just had a cake offers you a lollipop would you take it or say I just had my treat.' This approach made children respond better than asking direct questions such as 'how do you take care of your teeth?'. This not only helped the researcher to better interact with the children but also retain their attention on the activity. Instead of asking children to group the whole pile of cards into two groups, as in the pilot study in the main study, children were asked to choose any five cards they like and were asked individually which were healthy and which were not, in the cards they had chosen. This ensured participation of all the children in the group and less confusion. The field notes for children were recorded by both practitioner and the researcher. Similar to interviews template, the test template developed was only for guidance and the questions were personalised depending on children's attention span in each group. Though I did not intend to note the explanations given by children the variety and logical depth it gave to data made me note them.

These comments made by children helped in deciphering the extent of their logical abilities as explained in Chapter 9, Evaluation of nutrition education.

The data were collected from two research tools, interviews and nutrition knowledge recall test, however, no data were collected through 'Learning Journals' either due to lack of nutrition-related observations in the journals or due to lack of access to the journals. A detailed explanation was provided in analysis chapter 'Evaluation of nutrition education' (section 9.1.). The timeline for the second phase collection was from December 2015 to May 2016 maintaining the timeline was important to avoid the new EYFS assessment profile guidelines influence on collected data as much as possible. The process adopted to analyse the data from two phases and the sample demographics are discussed in the next chapter.

Chapter 6. Data analysis and Sample demographics.

This chapter outlines the data analysis methods adopted to deduce inferences from the first and second phase data and also about the characteristics of sample population in both the phases.

6.1 Data analysis methods

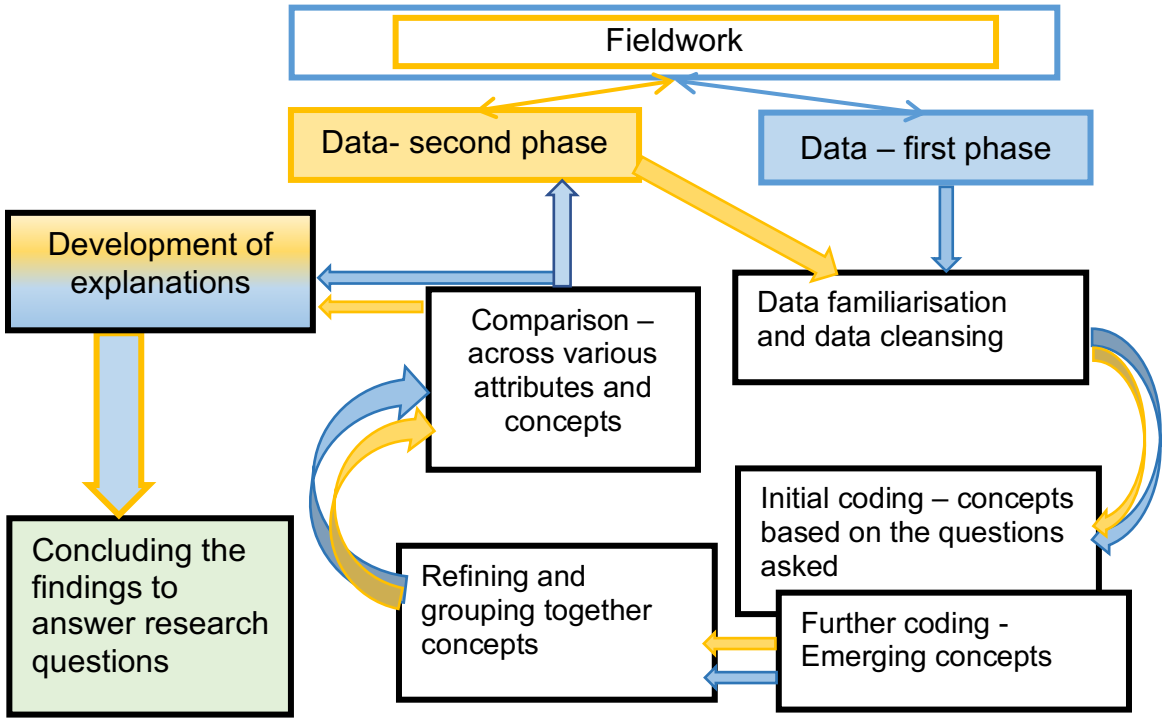
As the data were collected using mixed method approach the data analysis also involved more than one technique and software. However, grounded theory provided a common analytical approach for the whole data. This section has two sections: the first section outlines the elements of grounded theory adopted for analysis and also a detailed outline of the nonlinear research analytical process and the other section explains Inter-Rater Reliability (IRR) used to establish the reliability of data collected from children in the second phase. An effort was made to give a full account of the analysis process, however, as Corbin and Strauss (2014, p. 25) explained there might be a gap between writing about the analysis and doing it, as certain of the analytical dispositions couldn't be articulated or explained.

6.1.1. Grounded theory adoption

Grounded theory as the word suggests is a development of theories from the data and it was used for the analytical process and it was selected as the most suitable method for this research as the theory and themes were developed from the collected data. Glaser and Strauss (2009, p. 31) in their book stated that "Grounded theory can be presented either as a well-codified set of propositions or in a running theoretical discussion, using conceptual categories and their properties."

The data analysis in this research was presented taking the discussion approach. The responses were initially coded based on the questions to identify the categories. The categories were developed from these coded responses. The categories were gathered into the themes and the themes were discussed to infer the conclusions. Heath and Cowley (2004) in their paper discussed the grounded theory approaches of Glaser and Strauss by comparing and debating the role of induction, deduction and verification of the ways in which the data were coded, and theory was developed. In the paper they concluded that qualitative analysis was dependent on individual's thought process, which might lead to individualised approach in finding the theory and the purpose of the approach must not be to discover the theory but to identify a theory that could facilitate in understanding the area of research. This conclusion of the approaches to find the theory reinforced my personalised approach towards data analysis rather than debating the merits of various approaches.

Figure 6.1. Analysis process using grounded theory



The analytical process adopted in this research was nonlinear and is an association of the two phases. The analysis process adopted in this research based on the elements of grounded theory is represented in Figure 6.1. Field work for the first phase included collection of data from online survey. The data collected was cleansed. The cleansing process was necessary as I could not control the geographical boundaries online and I was focussing only on the settings in England. The cleansed data was initially coded and from these codes categories were developed. As the concepts emerged the initial theories were inferred and based on these theories second phase tools were developed. The procedure to develop second phase tools through first phase data analysis signifies grounded theory process. The grounded theory process involves development of theories and reinforcing them by going back to data collection to collect further evidence. Field work for the second phase involved interviews with practitioners and managers and also nutrition recall test for children. The collected data were initially coded, and concepts were developed. Concepts from both the phases were compared and similar concepts were merged. The theories were inferred from either the merged concepts or the contradicting concepts from the phases. Specific coding was further done if the data collected did not fit into the subsequent categories. Then the data from two phases were assigned to refined codes, which facilitated in comparing or contrasting the concepts. Discussions were developed, and conclusions were deciphered which aided to answer the research questions. The conceptualised discussions in the data analysis chapters (chapters 7-9) inform the various groups of concepts developed and the final chapter Discussion and Conclusion (Chapter 10) includes the inferences.

Coding is the most centralised process for execution of grounded theory (Bryman, 2016, p. 573). The data analysis was conducted using SPSS analytical software. Coding and data entry were done manually from the responses excel sheet, which was an attachment to the online questionnaire for recording the response. The data were coded on the basis of questions asked in the questionnaire and concepts were congregated together depending on similar attributes. Statistical analysis of the first phase data not only aided in the early concept development but also to develop the methodological instruments for the second phase data collection. The questionnaire (Annexure I) consisted of both open-ended and closed-ended questions. The type of responses also varied from question to question depending on the type of question. The coding process followed for data entry and analysis was done using SPSS software and NVivo software. For descriptive data, word clouds were used to develop the initial coding as shown in the example for nutrition-related topics (Figure 6.2). Word clouds are a method of visualising the text data, the frequency of the word usage is represented in the size and boldness of the text. This difference in size and boldness would help in spotting the trends and patterns which might be otherwise difficult to identify in the text. (McKee, 2014)

Figure 6.2. Word cloud for nutrition-related topics

Although a detailed analysis was done not all the information represented by data could be presented as expressed in the quote by Chip & Dan Heath “Data are just summaries of thousands of stories – tell a few of those stories to help make the data meaningful” (cited by Dykes (2012)).The concepts which aid in finding answers to the research questions were mainly discussed in the analysis chapters.

6.1.2. Inter-rater Reliability

The nutrition knowledge of children was tested using picture cards in a group of three to four and was called ‘nutrition knowledge recall test’ as explained in section 5.1.1.2. The picture cards were used for the test and for each question the children were requested to show the responses through picture cards or respond orally. The responses were recorded in the pre-prepared field notes sheet (Annexure III). The reliability of the collected data was established with Inter-Rater Reliability (IRR) which is explained thoroughly in this section.

Armstrong et al. (1997) in their research note emphasised that when the data were independently coded, comparing the coding for agreement should be important to establish reliability and also be one of the fundamental concerns for the researcher. In positive agreement with the statement, reliability in this study was established by IRR. Gwet (2014, p. 4) explained the concept of IRR in his handbook as “two individuals (raters) performing the classification, which was predefined, on the same set of objects to establish the reliability.” The responses of the children in the predefined field notes were marked by both early years practitioner and the researcher (me) independently in 7 settings of the sample to measure the IRR. The initial thought was to do IRR on seven settings which would be 22% of the total planned number of sample settings- 32 (section 5.4) as the general practice is to check for 20% of the sample size (Gwet,

2014). As the final number of sample settings, who agreed to participate in the research, did not reach the anticipated number of settings and the seven settings considered for IRR was 47% of the final sample (15).

The Cohen's Kappa statistics were used to determine the IRR using SPSS. The reliability was determined by regarding the data collected by practitioners in all the selected settings as one set of data and compare it to the data set collected by the researcher (me). The responses were coded into nominal values and categorised into researcher and early years practitioners in two columns in the SPSS. The IRR within the practitioners across the settings was not feasible as children varied from setting to setting, therefore, would not have object uniformity. The kappa (K) value was 0.856 ($p < .000$), which was a very high level of agreement, as kappa (K) value between 0.81 to 1.0 indicates almost perfect or perfect agreement (Hallgren, 2012). Hence, a practical decision was made to proceed independently for data collection in the remaining settings due to the high IRR achieved between the researcher and the early years practitioners.

6.2 Sample demographics

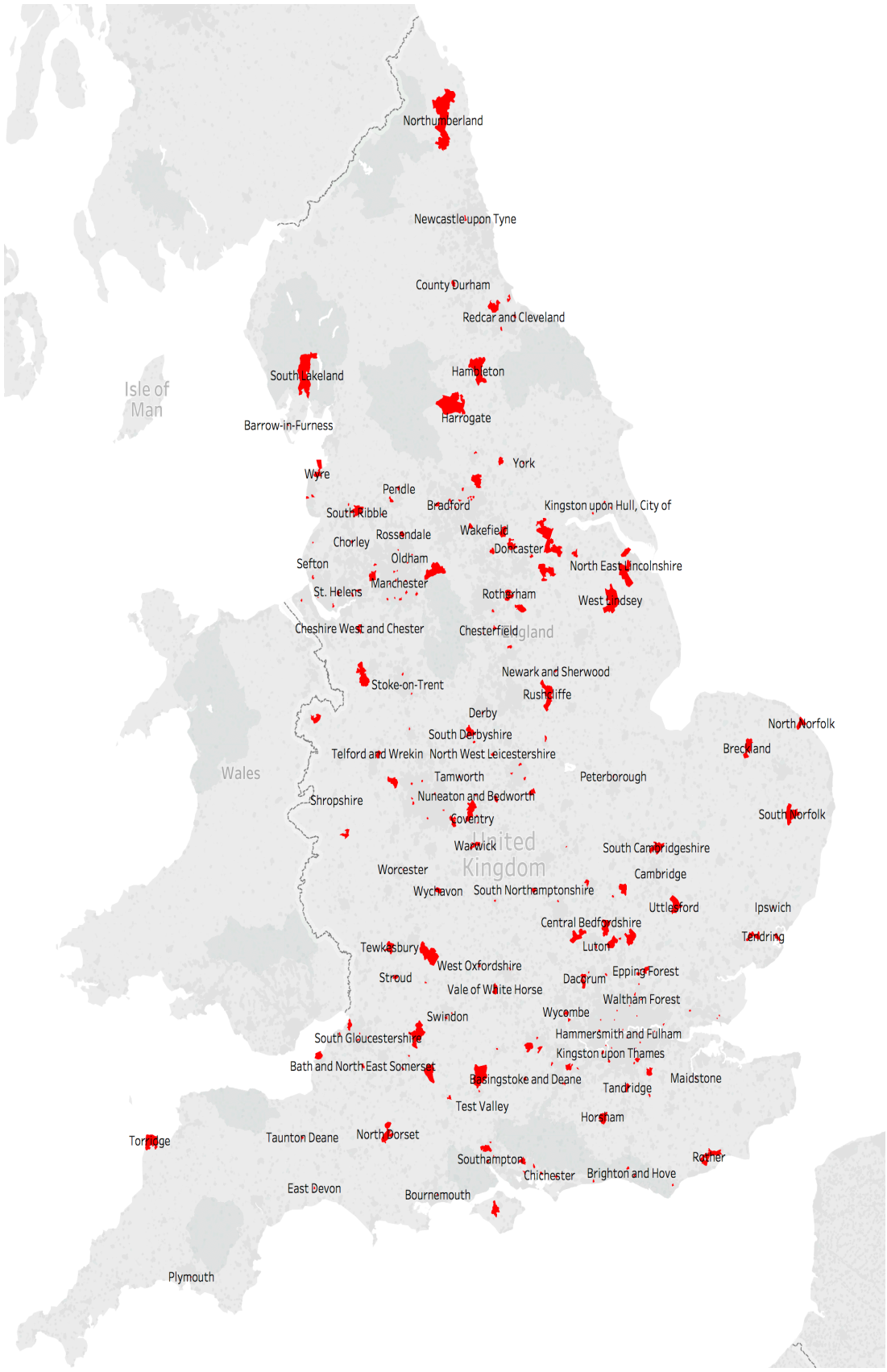
As the data were collected in two phases the sample of the participants was different for the first phase and the second phase. The first phase consisted of only early years practitioners from all regions of England whereas the second phase data collection was based in early years settings of Leeds and York and the participants were early year practitioners, managers and children. The key characteristics of sample population for each phase are explained in the next two sections.

6.2.1. First phase sample configuration

The data for the first phase of research were collected through the online survey a detailed procedure is included in First phase- methodology chapter (chapter 4). All the data were anonymously recorded in an Excel sheet attached to the questionnaire along with a date and time stamp and this collected data were cleansed and analysed using SPSS software and Tableau software was used for developing relevant maps.

Data through online survey were collected for a period of three months. There were 301-recorded responses. This research focused only on the status of nutrition education in early years settings in England, but the geographical restriction was not feasible during the collection, as the data were collected using social-media, and there were responses from all the four countries of the United Kingdom. Filtration of the responses was done using the first half of the postcode, the response for one of the question; for valid England practitioner responses. 276 responses were used for data analysis. The first half of the postcode helped in mapping the sample population areas as shown in Figure 6.3. However, all the place names were not included in the map due to space constraints, but all the postcodes were matched to the LSOA and represented on the map. LSOAs were utilised since 2004 to report geographic hierarchy statistics in England and Wales(National Health Services (NHS), 2018). The map clearly shows that the sample population was a well-distributed sample across England.

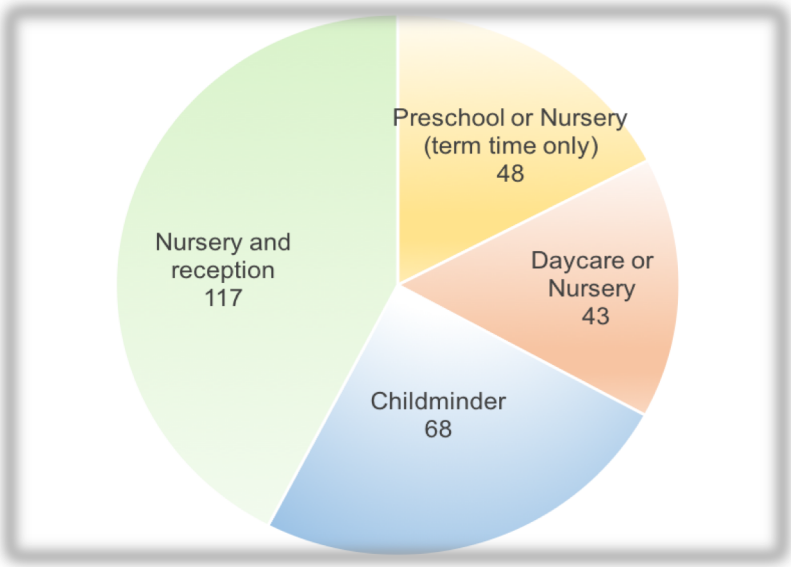
Figure 6.3. Map of England representing the first phase sample population.



Note: Maps not to scale

The responded practitioners also represent all the four types of early years settings, although majority of them were from 'nursery and reception'(117/276, 42%) the practitioners from 'day-care or nursery' (43/276,16%), 'nursery or preschool term time settings' (48/276,17%) and childminders (68/276, 25%) also participated as the pie chart (Figure 6.4) represents. All these first phase participants were referred to as 'surveyed practitioners' or 'surveyed participants' throughout this thesis.

Figure 6.4. Pie chart representing the distribution of surveyed practitioners from different types of settings.



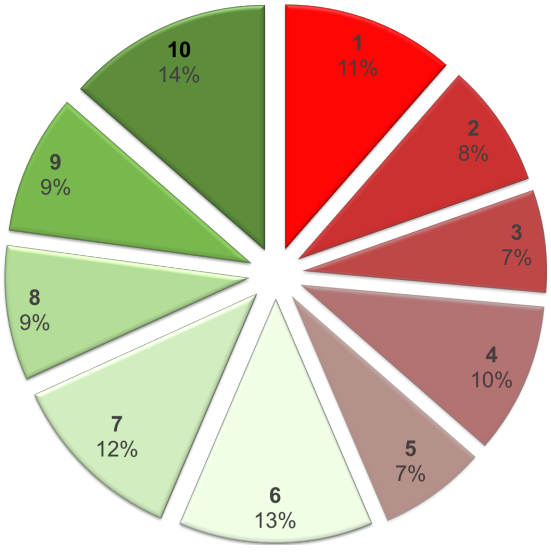
When the data were distributed region wise and tallied with the types of settings, there was a slightly higher response from the Northwest region and a lower response was from Northeast regions of England as shown in table 6.1. All the other regions were represented in the sample population at similar percentages. These sample demographics were later utilised to determine the associations between various topics in data analysis and infer if there were variations between the regions or between the types of settings.

Table 6.1. Participation from different Regions of England

Regions / Type of setting	London	South west	South east	East of England	East midlands	West midlands	North east	North west	Yorkshire and the Humber	Total
Child minder	7	10	13	12	4	5	4	7	6	68
Day care or nursery	7	7	5	3	3	6	1	5	6	43
Nursery and reception	17	7	16	9	6	14	4	24	20	117
Preschool or nursery (term time only)	5	9	4	3	6	8	0	9	4	48
Total	36	33	38	27	19	33	9	45	36	276

The other important characteristic was the IDACI decile, as explained in the second phase sample selection process (section 5.2), which was one of the variables for purposive sampling adopted in the second phase. The pie chart (Figure 6.5) represents the sample population areas in IDACI decile with 1 representing most deprived and 10 least deprived. The representation was almost even across the local areas' decile showing that there was representation from all the economical diversities of England.

Figure 6.5. Pie chart representing the IDACI decile distribution of sample population.



6.2.2. Second phase sample configuration

The second phase data collection was done at 15 sample settings in Leeds and York. Interviews, nutrition knowledge recall test and Learning Journal observations were the research methods used to collect the data. The method of data collection is described in Second phase- methodology (Chapter 5). The sample population of the second phase included early years practitioners, managers and children from the agreed sample settings.

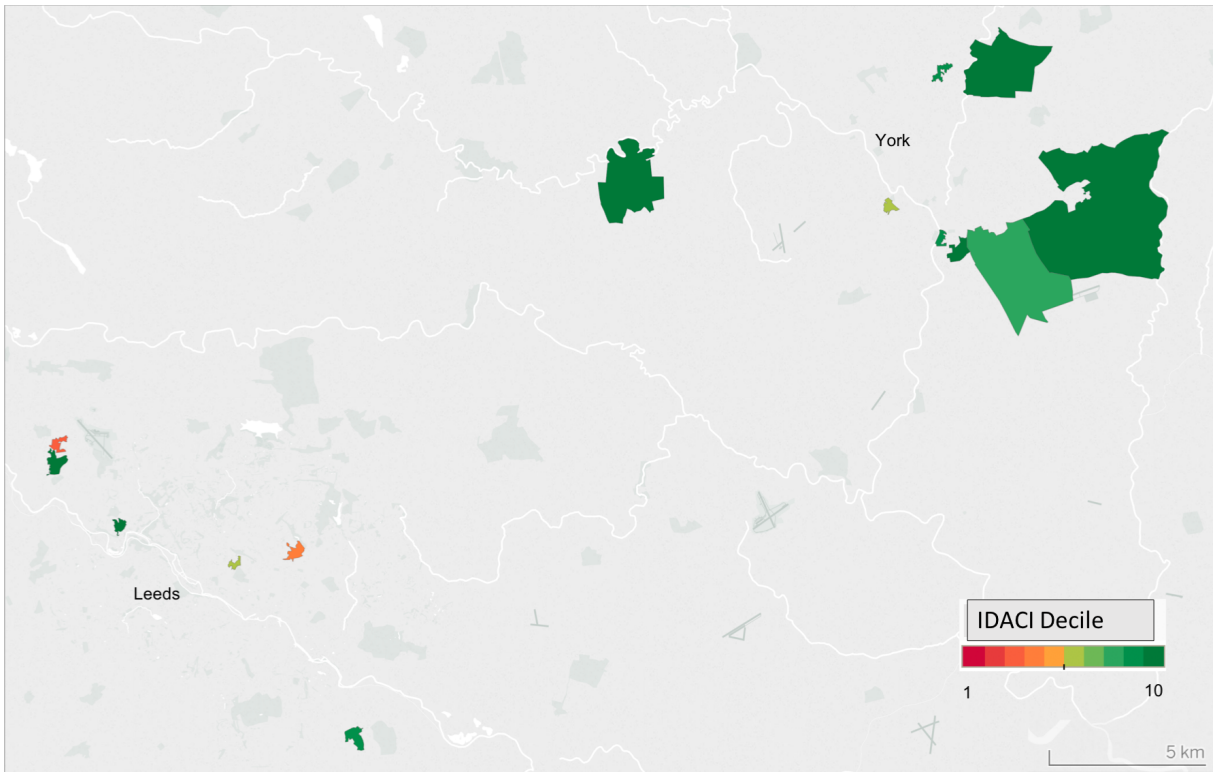
Table 6.2. Sample Matrix

Variables	Urban				Rural			
IDACI Decile	6-10		1-5		6-10		1-5	
Ethnically diverse	2	2			1	1		1
	1	1		1				
Ethnically not diverse	1	1			2			
					1			
	Reception class		Term time nursery or preschool		Full time nursery or day care		Child-minder	

15 settings agreed to participate in the research unlike the expected 32 settings, at least one sample to represent the combination of variables used in the purposive sampling. Sample matrix (table 6.2) represents the expected in the form of cells and the number within the cells represents participated sample settings. 9 out of which were urban settings and 6 were located in rural areas.

The map of Leeds and York (Figure 6.6) represent the IDACI decile one of the variables for the sample selection. The map was constructed similar to the first phase sample population map using only first half of the postcode of the settings, to protect the identity of settings.

Figure 6.6. IDACI decile of sample settings



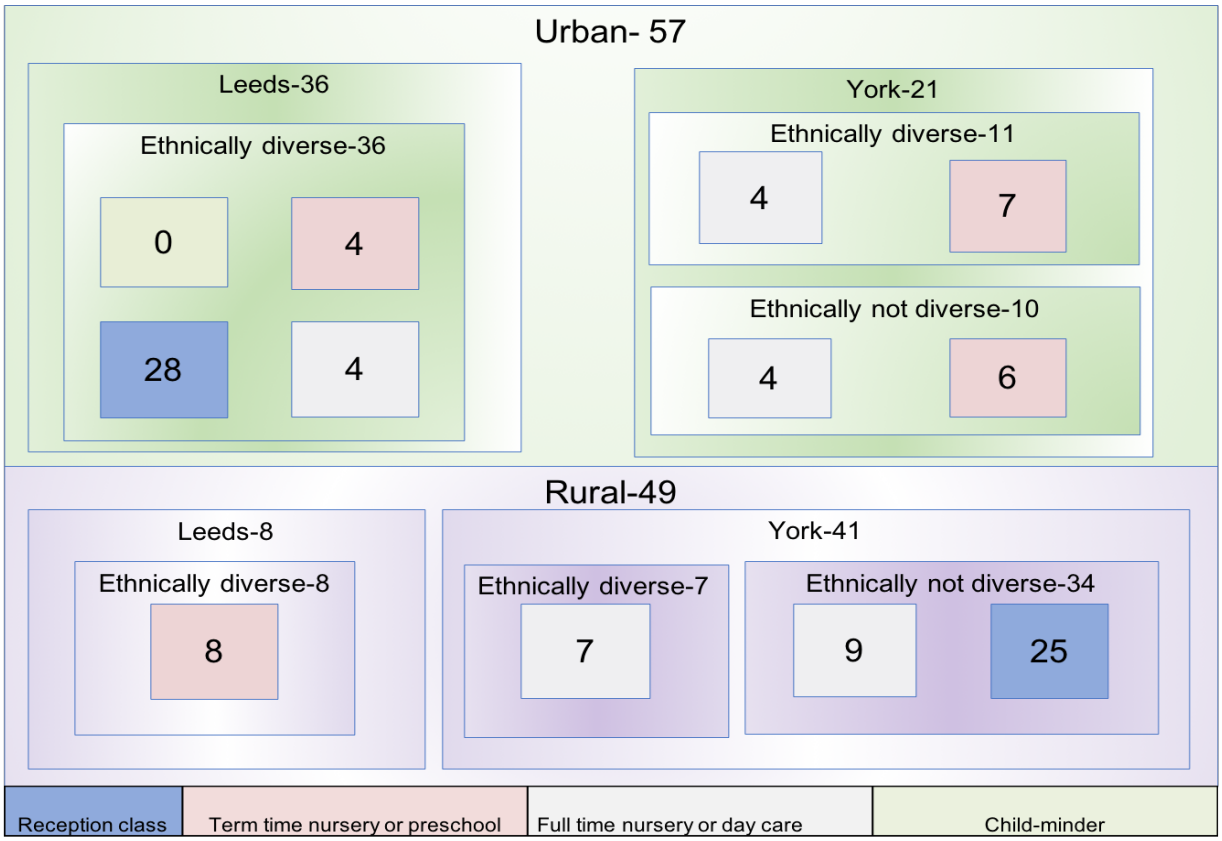
Note: Maps not to scale

The second phase sample practitioners were addressed as ‘interviewed practitioners’ or ‘interviewed participants’ or ‘interviewees’ in this thesis. Out of the 15 early years settings, two were single person operated settings which were childminders. 33 early years practitioners participated in the study including the 2 childminders. 9 managers participated in the interviews. All these participants were given pseudo names to quote them in the data analysis chapters. 106 children participated in the study, out of which

49 were from rural areas and 57 were from urban areas. The distribution of the children is shown in the following Figure 6.7.

The sample distribution clarifies that it was not possible to explore the influence of all the chosen variables. Out of the 15 settings agreed to participate in the research only 2 settings were located in areas classified as IDACI decile 1-5, So comparison between these two variables IDACI decile 6-10 and 1-5 as intended was not possible. However, the data when combined with the online survey could be generalised due to even distribution of surveyed sample across all the IDACI decile (Figure 6.5). An effort was made to infer variations between urban and rural settings for certain aspects. The influence of area on nutrition education is discussed in the data analysis chapters.

Figure 6.7. Distribution of the children who participated in the study



The research plan included observing the learning journals of participated children but acess was granted only at two settings. The journals were inaccessible in most of the settings due to the institute's policies. However even in these two settings, the key practitioner checked and indicated that the paricipated children didn't have any observations with regard to nutrition education. So, I was able to acess only two learning journals in which the practitioners felt there were relevant (nutrition education) observations. My observation of the journals indicated that although they were related to food preparation activities like baking the recorded observation did not provide any indication of children's nutrition knowledge. So, the learning journals were not used as research tool to draw conclusions, however, the practitioners were asked about learning journals and their responses were used to infer the conclusions.

Summary

Grounded theory was used to analyse the data. The data collected in two phases had 276 -online questionnaire responses, 33 practitioner's interviews, 9 managerial staff interviews and 106 children participated in the nutrition knowledge recall test. There were no learning journal observations. The online sample was well distributed representing all the regions on England, all the IDACI decile and also all the types of settings. The 15 settings participated in the second phase were from York and Leeds. The second phase final sample size was not the anticipated sample size which restricted the comparison between the targeted variables. However, the well distributed online sample provided the opportunity to understand the overall nutrition education status in England as discussed in the following chapters.

Chapter 7. Practitioner and managerial staff's perspectives on nutrition education in early years settings

The points of view of practitioners on providing nutrition education to children along with the influence of managerial staff and of institutes' policies on these points of view are discussed in this chapter in specific sections. The practitioners' sense of responsibility for providing nutrition education is discussed and also discussion to evaluate the EYFS framework's effect on nutrition education in the settings. Practitioners' and settings' standpoints are analysed concerning the appropriate age at which children should start nutrition education. This chapter also thoroughly discusses the confidence and knowledge of practitioners in delivering nutrition education. Finally, there is discussion of other factors influencing nutrition education in the settings, such as availability of resources and the influence of parents.

The first three sections of the chapter are set out to help to understand early years practitioners' perspectives, as they are vital in implementing nutrition education in settings. Kauchak and Eggen (1993) reinforced this opinion in the preface of their book Learning and Teaching "The way teachers think and what they know are two major factors that influence how they actually teach." The three sections are to understand the practitioners' opinions on: who is responsible for nutrition education; EYFS influence on delivering nutrition education; the appropriate age to start nutrition education.

7.1. Responsibility for providing nutrition education

This section explores how much responsibility the practitioners feel towards providing nutrition education to children. It also includes discussion about the impact of institute policy and the role of management in developing the practitioners' attitudes. About 9% (3/33) of the practitioners confirmed that they were responsible for delivering nutrition education to children. These practitioners' reason to take full responsibility to teach children about nutrition education was that children spent most of their time at the settings. "Many of them attend 9am to 6pm five days a week, having every meal at the setting" according to Furiosa, one of the interviewed managers. Department for Education (Department for Education (DfE), 2014a): Childcare and Early Years Providers Survey 2013 report stated that there was change in the last decade in the nature of care parents were expecting from childcare sector; there was move from sessional care to full-time provision.

This supports the opinion that the influence of practitioner is increasing on children as the time children spent at the settings has increased in modern days. The Survey of Childcare and Early Years Providers, England, 2016 published by (Department for Education (DfE), 2017b), showed that there were about 3.1 million preschool children in England attending various types of settings out of which nearly 1.2 million spend their full day at the setting (i.e. full day provision or reception). So, the practitioners' influence on the children could be increasing on children's nutrition knowledge, as most of the children's meals would be provided at the settings.

Nearly 50% (16/33) of the interviewed practitioners stated that it was an equal responsibility between practitioners and parents to teach children about nutrition

education, as the practitioners believed that the healthy practices promoted must be backed by each other to have impact on children. Many practitioners (42%; 14/33) expressed it was more parent's responsibility as food according to them, was more influenced by family habits. The attitude on responsibility might potentially have an impact on the way nutrition education is provided at the setting. The practitioners have an opportunity to teach children who spend at least a minimum of 11hrs of their weekday's time (all 3 to 4-year olds in England are currently entitled to 570 hours of funded early education or child care per year) in the settings which could be considerably more for many children. According to many of the interviewed practitioners and mangers many children spend 9am to 5pm at the settings during the weekdays. Professor Ashley Adamson (2017) in her presentation 'What does nutrition look like in schools today: is the whole school approach a reality?' at the 50th British Nutrition Foundation conference in London; emphasised that the amount of time children spend at schools offers a good opportunity to be utilised to improve children's nutrition knowledge. The parent practitioner coordination appears to play a key role in providing nutrition education.

The management's impact and the institute's policy also must be considered to fully understand the practitioners' attitude in dealing with nutrition education in early years settings. When managers in the settings were interviewed about providing nutrition education to children, they very keenly explained the healthy eating practices followed at the setting and care taken to develop healthy menus, which would offer children healthy choices throughout the week and care taken to be flexible in consideration with allergies and other dietary requirements. Five out of 9(55%) managers mentioned that their settings were a part of healthy eating settings or healthy school group encouraged

by the local councils. The setting's policy mostly consisted of providing healthy meals to children by carefully developed menus or regulating the type food the children have in their lunch boxes. So, the managers perspective of nutrition education could be providing the healthy diet, but no specific guidelines were mentioned in the policies in offering nutrition knowledge to children, which is the key point in my research. As providing healthy meals or regulating the lunch boxes may lead to habitual outcome but my research as explained in the Introduction and Literature Review chapters aims at cognitive outcome highlighting on how much nutrition knowledge children gain at the settings.

When practitioners were interviewed about institute's nutrition education policy; healthy eating at the settings was mentioned by practitioners (13/33, 39%) as institute's policy and also there were recent updates in the menu to promote it. In all these settings, staff members were encouraged to discuss the menus with parents and help them understand the need and importance of the improved menu but there was no clear indication on how much of this knowledge of healthy diet, which was encouraged at the setting, was also transferred to children. Some participants stated that (16/33, 48%), they were positive healthy diet was a part of their institute's policy, but they were not clear about providing nutrition education to children as institutes' policy. As the explanations given by these practitioners such as 'it is important in the institute's policy: by providing proper guidelines to healthy menus'; 'updating parents on changes in legislations'; 'being a role model to children' and 'it is day to day job' were too vague to support the nutrition knowledge aspect of learning. Though the last two explanations may lead directly to transfer of nutrition knowledge to children, only further analysis of the interview might reveal how far it was productive (Chapter 8 Implementation of

nutrition education). Three out of these 16 interviewed practitioners said that nutrition education was important in their institute as the manager was keen in promoting nutrition education through healthy menus and their manager and chef would take care of the policies and menus. Three (9%) of the interviewed practitioners were not sure about the institute's policy. Although the management in all these visited institutes were keen on the development of healthy menus, as majority of practitioners in these settings were neither certain on the importance of developed menus nor were encouraged to promote the healthy diet education, the opportunity to develop children's nutrition knowledge was lost.

Total responsibility for providing nutrition education was not felt by many of the practitioners except a few of them. Almost every visited setting claim to be a part of healthy school or settings encouraged by local councils, so the management was keen in developing the healthy menus at the settings. The concept of nutrition education at the settings could be limited to providing healthy diet but no concrete evidence was found through this discussion that either practitioners or mangers were providing nutrition knowledge to children.

The impact of EYFS, the statutory framework, on practitioners in delivering nutrition education is examined in the next section.

7.2. Early Years Foundation Stage (EYFS) framework influence

The statutory framework Early Years Foundation Stage (Department for children schools and families (DFE), 2008; Department for Education (DfE), 2012, 2014b) sets standards for the learning, development and care of children from birth to 5 years old, as discussed in depth in the Literature Review chapter (section 2.2.3). In EYFS it was

stated under the Prime area Physical Development (PD) that “Children must also be helped to understand the importance of physical activity, and to make healthy choices in relation to food.” (Department for Education (DfE), 2014b, p. 8).The ability of children to make healthy choices clearly implies that children should gain valid and relevant nutrition knowledge to make an informed choice. The impact of the EYFS on practitioners to deliver nutrition education was evaluated in this study by asking direct questions (such as if the practitioners were aware of nutrition education being a part of the EYFS and what they think might be the state of nutrition education if the EYFS framework was not statutory), and through indirect questions such as whether they recorded nutrition education related observations, as observations under each prime area were used to assess the progress of the child and to guide further learning activities. Going through recorded observations complemented these data.

The interviewed practitioners (94%,31/ 33) were aware that nutrition education was a part of EYFS and only 2 of them (6%) were not sure if it was included in the framework. Seven out of 9 managers (78%) were also aware it was included in EYFS framework. Although many of the interviewed practitioners were aware of nutrition education being a part of the EYFS, only 11 out of 33 interviewed participants (33%) and 73 out of 276 online participants (26%) recorded observations in relation to healthy diet education in children’s learning journals. The managers of the visited settings neither involved themselves nor encouraged practitioners in making nutrition-related observations in children’s learning journals. The few observations made in relation to healthy eating education, according to the practitioners, were mainly related to the likes and dislikes of children when they started at the early years setting; later on, observations were recorded only when the child tried new foods. So, this indicated that through the

observation of children's records there might be no substantial evidence of children gaining nutrition knowledge at the settings. Other evaluation procedures to assess children's nutrition knowledge are discussed in the Evaluation of nutrition education (chapter 9).

In case, there were no EYFS statutory guidelines to follow in future, all the participants (33) and 8 out of 9 managers (89%) were positive and confident that there would be no change in their settings in dealing with healthy diet, but they were sceptical about the standards in other settings. The managers' reasons for being doubtful about other settings were funding issues in maintaining healthy menus and also the unavailability of age-specific resources. Reasons given by practitioners were: 'it may 'take a back seat' in the settings' policies and also practitioners' attitudes may change; as it is not compulsory there is no need to do it.' Eleven of the participants (33%) felt the mandatory guidelines maintain the uniformity and standards across the settings and a statutory framework was needed to maintain the standards.

According to the participants, the EYFS framework was playing a vital role in securing the implementation of nutrition education in early years settings, however, the data suggested that the role was limited to providing healthy diet rather than enriching children's nutrition knowledge.

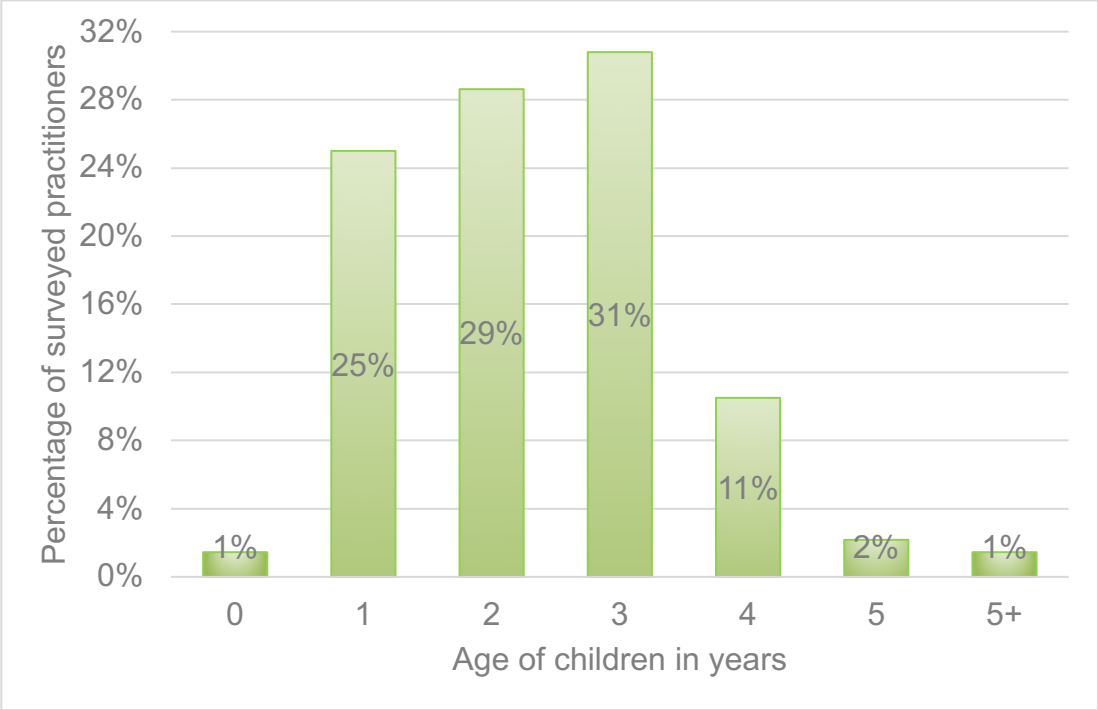
The practitioners' opinion on appropriate age for children to start nutrition education is discussed in the following section.

7.3. Ideal age for children to start nutrition education

The ideal age for children to start nutrition education according to practitioners and managerial staff is important as it determines the attitude, planning and resource development in the settings. Seven out of 9 (77%) interviewed managerial staff felt that 18 months was the appropriate age at which to start introducing information about healthy foods, as that was the age when children start tasting different foods. Ten out of 33 (30%) interviewed practitioners expressed ‘as soon as possible’, when children start weaning, “if children had early start to experience different foods, they accept easily the foods and as they grow children become choosier and more reluctant to try new foods.” Four out of 33 (12%) felt preschool age (2 years) was ideal to start, “as children start understanding and also start asking why; they start making choices and demand.” Three out of 33 (9%) interviewed practitioners and 2 out of 9 interviewed managers think three to four years age was ideal to understand about food groups and retain the knowledge. Two out of 33 (6%) interviewed practitioners felt that children below six years old were too young to understand and nutrition education must start when they were seven or eight years old. The online survey data as represented in the following graph (Figure 7.1) also show that 237 out of 276 (86%) surveyed participants thought the ideal age to start nutrition education was three years or below.

The majority of the participants agreed that the ideal age for starting nutrition education was three years or below; the notion of some practitioners that preschool children were too young to learn about nutrition education could be discarded with well-supported research evidence.

Figure 7.1 Surveyed participants' view on ideal age for children to start nutrition education.



Hendricks et al. (1989) in their study on the impact of a preschool health curriculum on children's health knowledge referred to McCarthy's eight recommendations for successful health instruction, the first and foremost recommendation was to "Begin health education during the preschool years." The importance of nutrition education in early years and its impact on lifelong habit development was further supported by many studies (Cooke, 2007; Knepple et al., 2012; Needham, Dwyer, Randall-Simpson, & Heeney, 2007; Niemeier et al., 2010) as discussed in Literature Review chapter. Most of the interviewed and surveyed practitioners' agreement that early years age was the ideal age to start educating children about healthy diet was also widely supported by research evidence.

Practitioners' viewpoint on nutrition education in early years was understood by discussion in the above three sections: responsibility for providing nutrition education, EYFS framework influence and appropriate age of children to learn about nutrition education. Most of the practitioners have agreed that the ideal age for starting children's nutrition education is between 3-5 years, however there was minor difference in the views of practitioners about who must be responsible in providing the nutritional education. Many of the practitioners indicated that it's a shared responsibility between parents and practitioners. As practitioners informed they did not make any observations with regard to nutrition education, this might imply that there would be no observations to be included in the day-to-day formative assessment(section 5.1.3). No observations in relation to nutrition knowledge were recorded by practitioners, by which it might lead to the conclusion, that inclusion of nutrition education observations in the assessment as a part of EYFS profile is not possible.

The above interpretation suggests that nutrition education is not widely considered as one of the responsibilities of the practitioners even though they agreed on early years as ideal age to start nutrition education; the analysed data are further discussed to understand how knowledge and practitioners' confidence influence nutrition education implementation in early years settings in the next section.

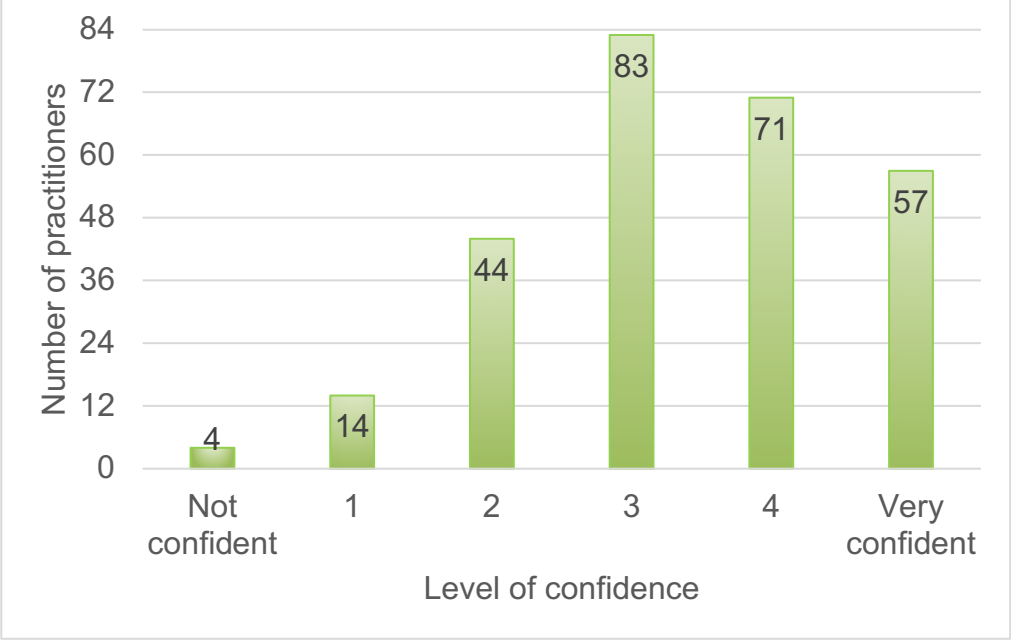
7.4. Knowledge and confidence in implementing nutrition education

The quality of nutrition education delivered to children in early years settings can be better understood by knowing the source of practitioners' nutrition knowledge and their confidence (Chan et al., 2002; Schroth et al., 2007; Vann et al., 2010). Ashkanani and Al-Sane (2012) in their study on 'Knowledge, Attitudes and Practices of Caregivers in Relation to Oral Health of Preschool Children.' concluded that the attitudes and level of

knowledge were positively and significantly favourable in improving caregivers' practices to promote oral health in preschool children.

As represented in Figure 7.2, nearly 77% (211/276) of the surveyed practitioners expressed their confidence level to deal with healthy diet topics was 3 or above on 0-5 scale (with 0 representing not confident and 5 representing very confident). The rest, 23% (62/276) expressed they were on lower levels of confidence and 4 of them were not confident in dealing with the nutrition-related topics. The higher percentage of practitioners being confident in providing nutrition education to children can be a positive indicator in the status of nutrition education in early years settings, however, the potential reasons for the low confidence levels are discussed further in the section to understand the impact on nutrition education learning experiences for children.

Figure 7.2 Bar chart representing surveyed practitioners' level of confidence in delivering nutrition education to children.



The confidence level is generally dependent on the knowledge base of the individual (Koriat, Lichtenstein, & Fischhoff, 1980), so the online survey included a question for practitioners to identify the sources of their nutrition knowledge with regards to educating children. The table 7.1 represents nutrition knowledge gained by surveyed practitioners through specific training was only 15% (43/276) and 15% (5/33) of interviewed practitioners did a nutrition and diet course. Fifteen out of 33 (45%) interviewed practitioners felt they need more support in dealing with the topic. The forms of support the practitioners expressed that they need: appropriate training 4(12%); reliable information 10(30%); fun activities or ideas 5(15%) and also access to information resources to share with parents 3(9%). This indicates that more support is needed for the practitioners to deal with the healthy diet topic, further discussion and analysis [Chapter 8] might help in determining the point.

Table 7.1. Response of practitioners about their source of nutrition knowledge

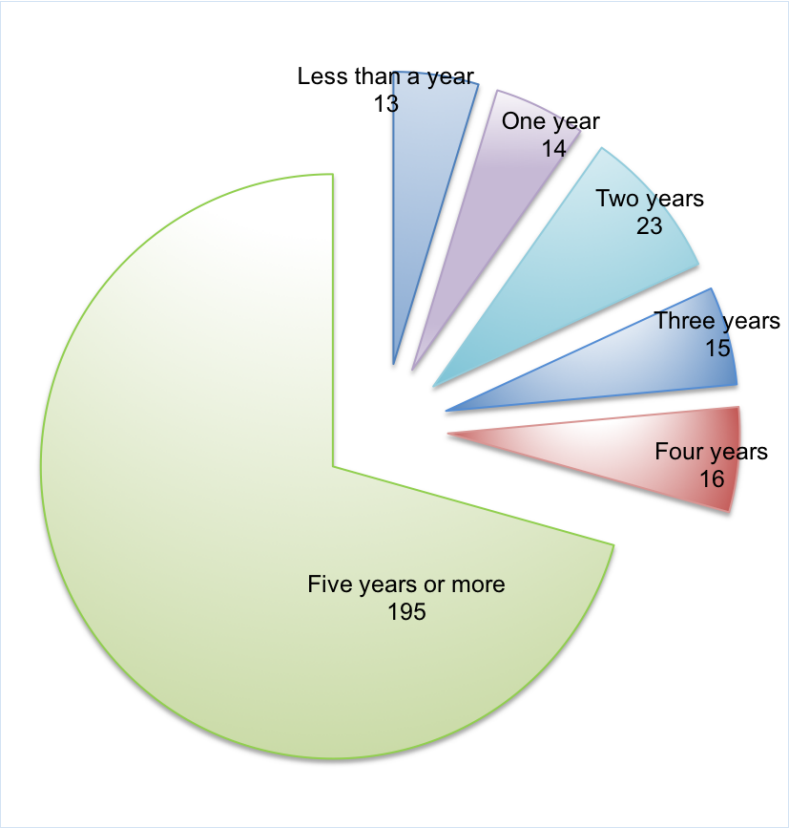
Source of nutrition knowledge	Responses for each source (N=276)
Experience	72%
Secondary education	32%
Higher education	22%
In job experience	18%
Specific training	15%
Other	14%
All the above	2%

Other sources of the knowledge (39/276, 14%) were developed by following particular kind of diets, diets developed on religious beliefs and also few indicated the lifestyle based on culture like ‘I am French’. The knowledge developed through certain viewpoints may or may not be validated scientifically; therefore, accurate nutrition knowledge training should be more appropriate than individual ideologies.

Table 7.1 also indicates the source of nutrition knowledge for most (200/276, 72%) of the surveyed practitioners was by experience and 18% (52/276) developed the knowledge through in job experience; 5 out of 33(15%) interviewed practitioners learnt by real life and job experience.

The pie chart (Figure 7.3) shows nearly 71% (195/276) of the surveyed practitioners had 5 or more years of in-job experience. As the surveyed practitioners indicated the knowledge was developed from their life experience, a chi-square test was conducted to check if there was any association between the years of in-job experience and level of confidence. The results (p=*0.587)* showed that the two variables were independent without any association, which was not a surprise as the knowledge gain from in-job experience according to practitioners was low (18%).

Figure 7.3 Pie chart indicating the years of experience for surveyed practitioners.



The formal education either at secondary level (89/276, 32%) or higher education (61/276, 22%) also emerged as one of the key factors for their source of nutrition knowledge. Bachelors' degree (179/276, 54%) or higher (17/276, 6%) was the highest educational qualification for nearly 60% of surveyed practitioners. NVQ3 or equivalent qualification (35/276, 13%) and Higher National Diplomas or equivalents (34/276, 12%) were the next main qualifications of the surveyed practitioners as Figures indicate in table 7.2. 11/33(33%) of the interviewed practitioners had done at least one food-related course as a part of their college course or NVQ level course. The chi-square test was conducted to test the association between level of education and the confidence levels and found that there was no association (p=0.185) between the two variables.

Table 7.2. Highest educational qualification

Educational qualifications	Surveyed practitioners (N=276)*
NVQ1	0.4%
NVQ2	3%
NVQ3 or Vocational Qualifications Level3 or GCE AS and A Level or Advanced Diploma	13%
Higher National certificates or Certificates of Higher Education or NNEB	8%
Foundation Degrees or EYTS or Higher National Diplomas or Diplomas of Higher Education	12%
Bachelors Degrees or Bachelors Degrees with Honors or PGCE or Graduate diplomas or Graduate Certificates	54%
Masters degrees or Postgraduate diplomas or postgraduate certificate of education or postgraduate certificates	6%
*There were 10 missing values	

The qualifications were categorised into 7 levels based on the 'Compare different qualifications' data from National Careers Service (2015); nearly 93% of surveyed practitioners had qualification at least NVQ3 or more and according to the Childcare and Early Years Providers Survey 2013 (Department for Education (DfE), 2014a) was improved from 2008, however, no effect on nutrition education could be found. About 32% of surveyed practitioners' nutrition knowledge was gained in secondary school, however, 4 out 33 (12%) of the interviewed practitioners expressed the view that younger staff were struggling in dealing with the nutrition-related topic, as they felt the younger generation's secondary school education did not provide the basic knowledge about nutrition. Unless the practitioners had a nutrition-associated course in their bachelors or higher education, there might be no chance to gain nutrition-related knowledge through formal education. Therefore, further understanding of the level of nutrition education at secondary schools could aid in understanding the level of nutrition knowledge in new practitioners.

Five out of 9 managers (55%) encouraged their staff to complete courses on food allergy and awareness. Six out of 33 (18%) of interviewed practitioners did courses on food hygiene or food safety assessment. The food allergy and food safety courses help in improving the standards of food provision in the settings, yet the nutrition knowledge transferrable to improve children's knowledge about healthy diet is not attained through these courses.

None of the visited settings provided any specific training related to the topic; according to the managers, the management along with chefs provided the necessary knowledge and also encouraged staff to develop by peer observations. Two (22%) of the managers

felt lack of age-specific resources or training related to topic was a hindering factor. Only 2 out 33(6%) of interviewed practitioners attended a course run by local councils, one of which was the healthy eating course conducted by York city council and the other was practitioners' training provided by Health Exercise and Nutrition for the Really Young (HENRY) in collaboration with Leeds city council. HENRY is a charity organisation that is aimed at supporting families and early year practitioners to provide a healthier lifestyle for children from their earliest years. These training sessions indicate the age and topic specific training sessions were available; most of the practitioners did not mention them indicated either lack of awareness or lack of resources to accommodate.

Although most of the practitioners were confident in dealing with healthy diet topic; the knowledge source for their confidence couldn't be associated with either their experience or their level of education. Most of the practitioners gained nutrition knowledge through life experience than through in job experience or specific training. Few of the managers indicated the requirement for age-specific support and training to improve the nutrition education experience for children. The discussion in the next chapter 'Implementation of nutrition education' would provide the insight of the knowledge and confidence of practitioners in delivering nutrition education and in next section factors further affecting nutrition education are discussed.

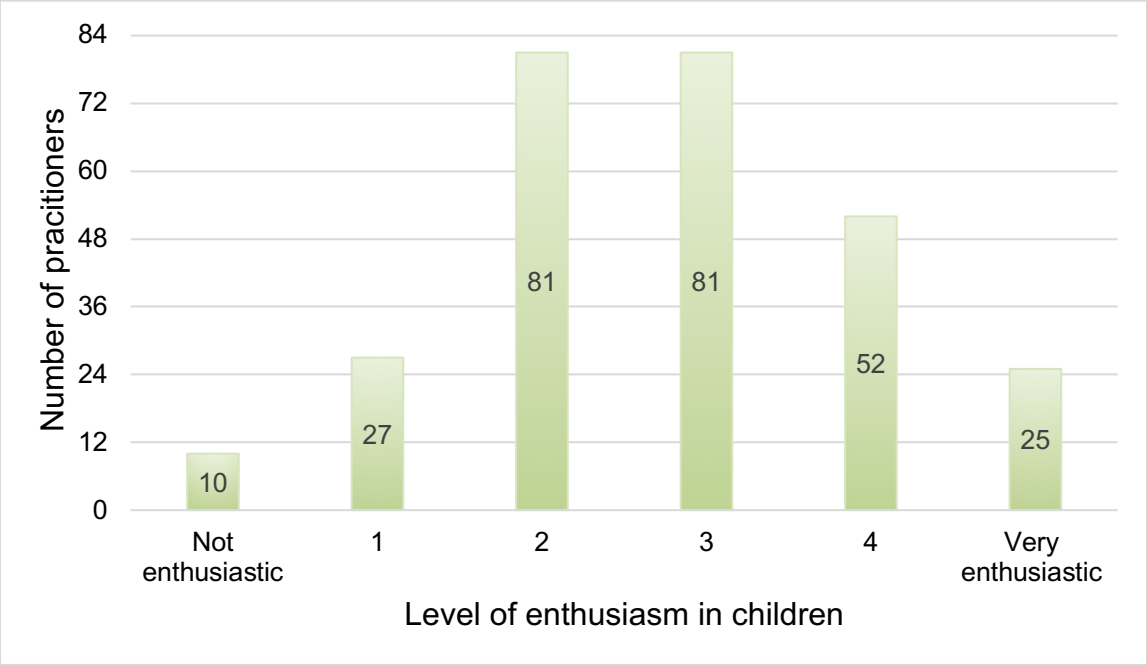
7.5. Other factors influencing nutrition education in early years settings

This section analysed data to understand what other factors were influencing nutrition education implementation in early years settings. The bar chart (Figure 7.4) represents the practitioner's observation about levels of enthusiasm of children towards nutrition education. On the scale of 0 to 5, where 0 represents not enthusiastic and 5 represents

very enthusiastic, 86% (239/276) of the practitioners stated that children showed moderate to high enthusiasm in learning about nutrition; nearly 60% of them were between 2 and 3.

This level of enthusiasm in children is an encouraging factor to implement nutrition education in the settings; however, children's level of understanding was expressed as a hindering factor by 12 out of 33 (36%) of interviewed practitioners. As Gorelick and Clark (1985) in their study, 'Effects of a nutrition programme on knowledge of preschool children.', suggest that a classroom nutrition education programme could be effectively implemented, even to preschool children, if age appropriate materials were used; better training and resources could aid practitioners in delivering nutrition education in an age appropriate manner. This might help the practitioners to overcome the children's low level of understanding.

Figure 7.4 Practitioners' reflections of children's level of enthusiasm towards nutrition education.



Nearly 55 % (152/276) of the surveyed practitioners faced constraints to deal with nutrition education as shown in the table 7.3. Family or home environment was considered as constraint factor by 35% of the surveyed practitioners; a similar view was also expressed by interviewed practitioners (6/33,18%) and 3 out of 9 (33%) managers, who also felt that parents were hindering factors. Few of the statements were: Poppy, one of the practitioners, said “There used to be peer pressure on parents like what type of chocolate you carry for the kid after school. There is a positive change over years like no more chocolates”. In Fuchsia’s, one of the managers, experience though parents agree to encourage healthy eating, ‘she had seen parents providing treats to children on regular basis, which she felt was not productive in encouraging children to have healthy choices.’ Radilla, another manager, noted that faulty food habits like blended (semisolid) food even in later years encouraged by parents can act as a hindering factor for children to try new foods at the settings. Buena, a manager in one of the visited settings, said “It’s very important to make healthy choices…. but balance it [the diet offered] so that they are not pushed away”; as she had seen same choice of food (boiled chickpeas) in the lunch boxes every day without any variations. Polly, one of the practitioners, expressed it was difficult to make parents understand about rules “We had severe nut allergy boy and had hard time convincing one of the parents why other children are not allowed nut related products in their lunch boxes.”

Table 7.3. Constraints felt by practitioners while dealing with nutrition education

Factors	Surveyed Practitioners (N=276)*
Family or parents	35%
Children’s likes and dislikes	11%
Allergies	7%
Easy availability and advertising	1%
*The number of responses were 152(n).	

Hurst and Joseph (2009, p. 261) in their chapter ‘Parents and practitioners’ in the book ‘Working with Children in the Early Years’ see the relationship between parents and practitioners as a vital factor for the well-being and development of children in early years. So, for the betterment of the children’s nutrition knowledge, working with parents and providing required assistance to understand nutrition is an essential approach to be adopted by practitioners.

Lack of ideas or resources to develop learning activities was one of the hindering factors felt by 6 out of 33(18%) interviewed practitioners. Some of the managers (2/9, 22%) also had concerns about lack of resources, the associated training and how cost effective they would be. Fifteen out of 33(45%) interviewed practitioners felt they need more support in dealing with the topic. The support the practitioners expect were reliable information (10/33, 30%), fun activities or ideas (5/33,15%), appropriate training (4/33,12%), and access to information resources to share with parents (3/33, 9%). This again shows the lack of training (as discussed in section 7.4) and knowledge of available resources.

Other concerns expressed were about fussy eaters and children’s likes and dislikes. Chambers (2017) in her BNF 50 Talk about ‘Establishing healthy eating behaviours in the early years’ suggested that repeated taste exposures and sensory exploration techniques were supported by research to improve the acceptability of new foods by children, which can be fortified by research evidence (Carruth et al., 2004; Wardle et al., 2003).

Regulatory bodies could be seen as influential in making certain choices; “Ofsted restrictions on baking … need to balance it and realise baking is not only about making cakes” was the view of a child-minder, which hinders children participating in food preparation.

Eleven out of 33 (33%) interviewed practitioners and 9 out of 276 (3%) surveyed practitioners expressed there were no hindering factors in dealing with nutrition education; the higher percentage of interviewed practitioners in visited settings expressing no hindering factors than surveyed practitioners could be due to lack of response to the open-ended question in the survey (161/276, 58%). The majority (271/276, 98%) of the surveyed practitioners dealt with the healthy diet topic at least occasionally, which is discussed in-depth in next chapter section 8.2. The minor group (5/276, 2%) who do not talk about nutrition education in the setting gave the reasons like children being too young (2), children with English as an additional language (1), lack of confidence (1) and management issues (1). These issues for not dealing with the topic seem more general than specific to nutrition education.

Children’s enthusiasm levels were observed as moderate to high in learning about nutrition education. Parents or family influence was one of the main constraints faced by many practitioners to efficiently deliver nutrition education. The other main constraint expressed by management was lack of age-appropriate resources and training; which could also be affecting practitioners in dealing with children’s likes and dislikes, children with English as an additional language and also developing a better level of coordination with parents.

Summary

Nearly 50% of the practitioners stated that nutrition education must be the responsibility of both parents and practitioners with parents playing a key role. Most of the practitioners were not considering themselves wholly responsible in providing nutrition knowledge to children even with increasing number of hours spent by children at the settings (nearly 1.2 million children spend full day at the setting). Most of the practitioners stated that 3-5 years of age was ideal to start nutrition education and also that children show considerable enthusiasm to learn about nutrition. Many practitioners (75%) were confident in delivering nutrition education to children and the knowledge they developed was mostly by life experience.

Lack of specific training and resources could be the cause for lack of confidence in some of the practitioners (25%). Parents and children's like and dislikes were amongst the key constraints in delivering nutrition education. Proper training and resources could help in overcoming most of the constraints or hindering factors in delivering nutrition education identified by the practitioners. The influence of the EYFS statutory guidelines on nutrition education was not significant as practitioners mentioned that they do not make regular observations regarding nutrition, therefore it could be considered that it is not part of EYFS formative assessment relating to one of the ELGs, which could be a positive outcome as settings continue their healthy diet education irrespective of the guidelines statutory or non-statutory. However, the standard of the nutrition education on offer is to be understood by discussion in the next chapter.

Chapter 8. Implementation of nutrition education

A study by Knepple et al. (2012) suggest nutrition concepts taught to children on weekly basis using age-appropriate activities and resources might vastly improve children's nutrition knowledge, this chapter discusses the findings on the nutrition education topics dealt in the settings, planning done by practitioners and also occasions and frequency for their implementation. The state of nutrition education in early years settings could be established by finding answers to what, how, where and when questions about nutrition education: what nutrition-related topics were dealt with and how they were implemented; where the opportunities were to utilise, and when were they utilised. Then comes the who and why questions regarding nutrition education; answers could be inferred through discussion on why it's important to know about it and who will benefit from knowing the current status. This chapter is about how the nutrition education is being implemented, so, by understanding how the leaning techniques are implemented we could understand the planning and nurturing of children's nutrition knowledge and if the progress was included as the recorded observations in the EYFS assessment.

Many intervention studies reinforce that the selection of topics along with teaching techniques adopted and consistency in dealing the topic were crucial in increasing the nutrition knowledge of children (Bellows et al., 2008; Dunn et al., 2006; Fuller et al., 2005). Data regarding the dealt nutrition topics, learning activities associated in implementing, staff planning that goes behind these activities and also opportunities and regularity to implement collected from surveyed and interviewed practitioners and management were analysed and are discussed in three sections. The first section of

this chapter focuses on elucidating to what nutrition topics that were dealt within the settings and how were they implemented. The next section focuses on the planning that was done to select and implement topics. The final section emphasises where and when the practitioners find opportunities to teach children about nutrition education.

8.1. Topics of nutrition education and the techniques used to implement them

An insight into the topics of nutrition education might aid in understanding not only the quality of education provided but also gives an opportunity to analyse practitioners' view on early years children's level of understanding. The nutrition-related topics mentioned by surveyed practitioners and interviewed managers along with those implemented by the interviewed practitioners were tabulated in Table 8.1. The surveyed practitioners in the online questionnaire and interviewed managers during the face to face interview mentioned the topics as an answer to a direct question, whereas the interviewed practitioners' topics were consolidated from the overall interview.

The learning activities mentioned by the interviewed practitioners at the settings could be associated with many of the nutrition-related topics; so, each learning activity is discussed along with the topic where it is mostly used and also mentioned wherever it is associated. The surveyed practitioners were asked to mention five important topics, which were appropriate to be included in early years nutrition education. The keywords were identified (Chapter 6) and categorised into 13 broad groups.

Nearly 62% (179/276) of surveyed practitioners responded, 'healthy diet' or 'balanced diet' as one of the main topics for this open-ended question. The related topic 'Healthy me' was implemented by interviewed practitioners (11/33, 33%). 5 out of 15 visited settings had this 'Healthy me' week at least once a year in which most of the activities

at the settings concentrated on encouraging children to have a healthier diet and also learn how to be healthy. As ‘healthy diet’ or ‘balanced diet’ or ‘healthy me’ are very broad terms: almost all other topics support it or contribute to it. As mentioned earlier healthy diet was a broader term, all the learning activities mentioned could be directly or indirectly related to the topic. The learning activities are discussed along with the topics where they were directly used.

Table 8.1. Nutrition-related topics dealt at settings according to the participants.

Topics	Surveyed practitioners (n=276)	Interviewed practitioners (n=33)	Managers (n=9)
Hygiene	44 (16%)	2 (6%)	4 (44%)
Nutrients	50 (18%)	none	none
Water	60 (22%)	2 (6%)	none
Portion size	60 (22%)	4 (12%)	none
Dental health	67 (24%)	none	4 (44%)
Other	68 (25%)	none	1 (11%)
Food preparation and sources of foods	72 (26%)	12(36%) 16 (48%)	4 (44%)
How food helps body	73 (26%)	none	none
Exercise	80 (29%)	none	none
Sugar and Treats	83 (30%)	2 (6%)	1 (11%)
Fruits and Vegetables	85 (31%)	7 (21%)	2 (22%)
Healthy diet or Balanced diet	170 (62%)	11 (33%)	7 (78%)
Trying new foods	none	23 (70%)	5 (56%)

The children were taught about healthy diet through various learning activities such as food discussions, workshops, games, role-play, gardening, food preparation and role modelling. One of the 15 visited settings used ‘Information boards’ to convey nutrition-related messages to parents such as new menus but they were not used in providing

information to children. Other research studies also suggested that children at this age develop the logic to make their own food choices and also develop intuitive theories about nutrition (Gripshover & Markman, 2013; Sigman-Grant et al., 2014), so the appropriate nutrition knowledge provided for preschool children could aid in developing the intellectual ability to make informed food choices.

Role modelling was mentioned as a key activity by only 1 out of 33 (3%) interviewed practitioners, although according to the managers the staff members in all settings took their meals along with children. Many of the interviewed practitioners not mentioning about it as a learning activity for children led to the assumption that the practitioners were silent modelling; research review suggested that enthusiastic teacher modelling was more effective than the silent modelling (Hendy & Raudenbush, 2000),. The interviewed managers (7/9,78%) also felt inclusion into other areas such as in mathematics- measurement, shape etc. might be helpful in educating children about healthy and unhealthy foods, but no evidence of implementation was found.

Food preparation and sources of foods were mentioned together by 26% surveyed practitioners (72/276) as one of the nutrition topics children could learn. The interviewed practitioners (16/33, 48%) and interviewed managers (4/9, 44%) considered children knowing about the ‘sources of foods’ as one of the main topics. Most of the interviewed practitioners, who considered ‘source of food’ as the main topic, arranged visits to food shopping in supermarkets, local markets and farm carts for children to discover about ‘where food comes from’. Interviewed practitioners in 2 out 6 visited rural settings, mentioned they took children to local farms to show where it is produced. Interviewed practitioners in the other three rural settings did not mention about any farm visits but

took them to local markets or farm markets whereas children from urban settings mostly visited supermarkets. Flavin, one of the practitioners working in an urban setting, stated that due to changes and new developments in the community they were unable to take children to local farm shops or local butchers. One of the settings used food mapping, to explain foods grown in different countries.

Around 36% of the interviewed practitioners (12/33) mentioned food preparation as one of the learning topic used in nutrition education. One of the settings had arranged 'Tesco rainbow hands-on experience' for children in which they learnt how food is prepared. The most common methods used in preparation activities were baking, soup making and salad making. Poppy, an interviewed practitioner, mentioned that "Children loved making soup and one child loved it in particular and her knowledge was really good on preparing….". Making soup with children was mentioned by two other interviewed practitioners as the most memorable experience with regard to nutrition education. The interviewed practitioners also observed that children when involved in food preparation, tried and accepted new foods more readily, Hersch, Perdue, Ambroz , and Boucher (2014) review of the research studies also confirmed that cooking programmes had a positive influence on children in accepting foods, attitudes and behaviour. Stacy, an interviewed practitioner, mentioned that a child started trying carrot during the soup making process and had seen him accept it in future also without any protest.

Gardening was one of the learning experiences used by interviewed practitioners (9/33, 27%), in which they found children not only learn how foods were grown but also become more willing to try the grown produce. The setting managers in 2 out of 15

(13%) visited settings also emphasised growing fresh vegetables and fruits at their settings. Gardening as a learning activity was recognised in research also to increase the acceptance of fruits and vegetables by children (Brouwer & Neelon, 2013; Cabalda et al., 2011; Heim et al., 2009; Triador et al., 2015); however not all the practitioners in the settings with garden facility mentioned gardening as one of the learning experiences to enhance children's nutrition knowledge. The practitioners who mentioned about gardening also observed that children showed more willingness to try new foods such as snap beans and carrots. Food preparation and sources of foods as a topic and the learning activities led children in trying and accepting new foods but how much knowledge the children were gaining was not clear except few glimpses in certain settings such as food mapping to know foods around the world, visits to markets and farms and also gardening to understand how food was grown.

One of the other topics mentioned by 85 out of 276 (31%) surveyed practitioners was fruits and vegetables; interviewed practitioners (7/33, 21%) and interviewed managers (2/9, 22%) agreed that knowledge about fruits and vegetables could be part of children's nutrition education. In the visited settings, many of the practitioners did not mention about fruits and vegetables except in the context of children trying them. Yasim, one of the interviewed practitioners, observed that the Role-play shop they had set up for children with real fruit and vegetables ended up as picnic children trying them. Food discussion (8/33, 24% interviewed practitioners) with children on question such as 'vegetables-why are they good?' and 'fruits versus chocolates' was one of the methods adopted to teach about fruits and vegetables. Stark et al. (1986) in their study found that discussions with children on the children's choice food items at the settings helped in improving the food choices. 'The Very Hungry Caterpillar', storybook by Eric

Carle first published in 1969, mentioned the settings by interviewed practitioners (8/33, 24%) was also associated with educating children about fruits and vegetables. Gripshover and Markman (2013) in their study found that children's nutrition knowledge has significantly improved by reading five storybooks (e.g., "after we stir the sugar, what do you think will happen?") for 12 weeks at frequent intervals with interactive questions. So, if practitioners were provided with the more resources- storybooks might aid in improving the nutrition knowledge of children. Coloured days were special occasions created at the settings to do all the activities based on chosen colour that is for example 'Red-day can be used to learn about red coloured fruits and vegetables such as strawberries and tomatoes.' Gardening, which was mentioned earlier, could also be accounted as one of the key learning activities to learn about fruits and vegetables, as the interviewed practitioners had mentioned it improved the acceptance of fruits and vegetables but there was no evidence on how much knowledge children were gaining; While it could be established that children gained knowledge to identify the vegetables and fruits.

Surveyed practitioners (22/276, 8%) as a part of teaching about fruits and vegetables mentioned '5-a-day' concept, whereas it was not mentioned in any of the visited settings. WHO introduced this 5-a-day concept to encourage people to meet the minimum recommendation of 400g/day of fruits and vegetables, to add variety in the diet 3 portions of vegetables and 2 portions of fruits were suggested a portion being 80grams. This concept was adopted in many countries including the UK to improve the overall health status (Ashfield-Watt et al., 2004; Naska et al., 2000). The UK government adopted the concept officially in 2003 and promoted by NHS to encourage healthy eating (Mosley, 2013; National Health Services(NHS), 2015b). Two of the

practitioners after my children's nutrition knowledge test (Chapter 9) expressed that concept was for older children and not suitable for early years children. This concept is further discussed in the Conclusions chapter.

Surveyed practitioners (83/276, 30%), interviewed practitioners (2/33, 6%) and interviewed manager (1/9, 11%) mentioned about creating awareness about sugar. All the managers (9/9) mentioned they planned their menus carefully only providing healthy choices for children limiting on the sugar content, but not many of them included sugar as the topic to educate children. Food discussion (chocolate versus fruit) as mentioned earlier was one of the learning activity and the other mentioned activity was a workshop by a dental nurse. Polly, one of the interviewed practitioners, stated that she "Did not realise the amount of hidden sugar until shown by a dental nurse in one of the workshops." 'The very hungry caterpillar' book also could be related to learning about sugar as in the story 'the caterpillar becomes sick after having too many treats'. Sugar in the foods children consume cause problems such as dental caries and obesity affecting long-term health and well-being (Kranz & Siega-Riz, 2002; Y. Lee & Joo, 2016; Lim et al., 2009; Linardakis et al., 2008), so, it is important for children to be aware about sugar and which foods have more of it causing problems. Public Health England launched a (Public Health England, 2015) programme to provide knowledge on available alternatives for high sugared foods, but this was not mentioned as one of the resources utilised at any of the settings. So, this shows despite the availability of resources either practitioners were unaware or not using to full potential.

Portion size, as recognised by research that it impacts pre-schoolers well-being (Looney & Raynor, 2011; McConahy et al., 2004; Small et al., 2013), was mentioned by 60 out of 276 (22%) surveyed practitioners and 4 out of 33 (12%) interviewed

practitioners. Stacy, one of the practitioners, stated: “Child-led dinner plates helped children understand how much to serve and also try new foods”. So, this child-initiated activity encouraged children to explore how much should be served and also peer influence encouraged them to try new foods. Weber et al. (1999) research on portion size estimation indicates that it varies from food to food and wide-ranging which requires regular training; as child-led plate followed in the visited settings is a day-to-day activity, practitioners might be able to make children understand about portion size on a regular basis if properly planned and executed. Hendy and Raudenbush (2000) in their research study found that peer modelling was effective, and girls were slightly more responsive to peers than boys.

Water was one of the topics mentioned by surveyed practitioners (60/276, 22%) whereas interviewed practitioners (2/33, 6%) mentioned it was more a seasonal topic. In Summer months, the interviewed practitioners encouraged to have water by telling children ‘why it is important to be hydrated’. Although all the settings do not allow soft drinks in the premises due to improved awareness and including the new government guidelines (Goodwill et al., 2017) there is need for children to learn about water as studies show the overall intake of soft drinks had increased over years (Fox et al., 2010; Sweetman, Wardle, & Cooke, 2008; Vereecken et al., 2008) and dehydration was one of the avoidable causes for children’s hospitalisation (McConnochie et al., 1999).

Hygiene is one of the other topics mentioned by both surveyed (44/276,16%) and interviewed (2/33, 6%) practitioners. No learning activities were mentioned during the interviews in relation to hygiene. Hygiene and dental health were mentioned together by 4 out of 9 interviewed managers (44%). Dental health was stated as one of the topics

by 67 out of 276 (24%) surveyed practitioners. However, no learning activities were directly associated with this topic in the visited settings, except a workshop conducted by a dental nurse in one of the settings. This workshop was mentioned in relation to creating awareness about sugar, but as a dental nurse conducted it something related to dental care probably was been included.

The surveyed practitioners (68/276, 25%) also mentioned other topics which were grouped as other, represented in the bar chart (Figure 8.1). The topics included under other were milk, sleep, social aspects, food cost and wastage. The 'social aspects' was mentioned by one of the managers (1/9,11%) highlighting the importance, which was similar to surveyed practitioners' view, as importance of having meals together in the settings as well as in the family environment. Some of the terms mentioned by the surveyed practitioners in the online questionnaire were further explained: milk- good for bones, milk is good drink to have other than water; food cost and wastage- reasons for not wasting food and how difficult it is to produce food. Surveyed practitioners also mentioned topics nutrients (50/276,18%), 'how food help body' (73/276,26%) and exercise (80/276,29%). None of these topics were mentioned in the visited settings nor was able to associate any learning activities to these topics.

Encouraging children to try new foods emerged as one of the main topics during the interviews with practitioners (23/33, 70%) and managers (5/9, 56%). Children's trying new foods was one of the memorable events in dealing with nutrition education for 7 out of 23 interviewed practitioners. Games (4/33 interviewed practitioners, 12%) were also developed to encourage children to try new foods.

Steffy, one of the interviewed practitioners,

> We had a little boy, who used to eat only specific food, it was very difficult to make him try different things. The other children were quite keen to follow him 'I can eat only this, I can eat only that.' Introducing self-service, let them have a little bit to try and come back to have more. It helped him a lot. I think they like the responsibility of doing it.

As discussed in earlier paragraphs, the learning outcome observed by the interviewed practitioners for the topic- food preparation and sources of foods was children trying new foods and no information was mentioned on how it improved their knowledge. All other learning activities such as gardening, role-play, child-led plates were also associated with children trying new foods. Trying new foods was important in the interviews but not mentioned in the survey as topic. Trying new foods could be considered as learning out come by the surveyed practitioners rather than a specific topic. The goal for every nutrition learning activity was focused on child trying food, this practical applicability must have led the interviewed to mention it as a topic.

Figure 8.1. Bar chart representing nutrition-related topics that the practitioners considered appropriate for early years children.

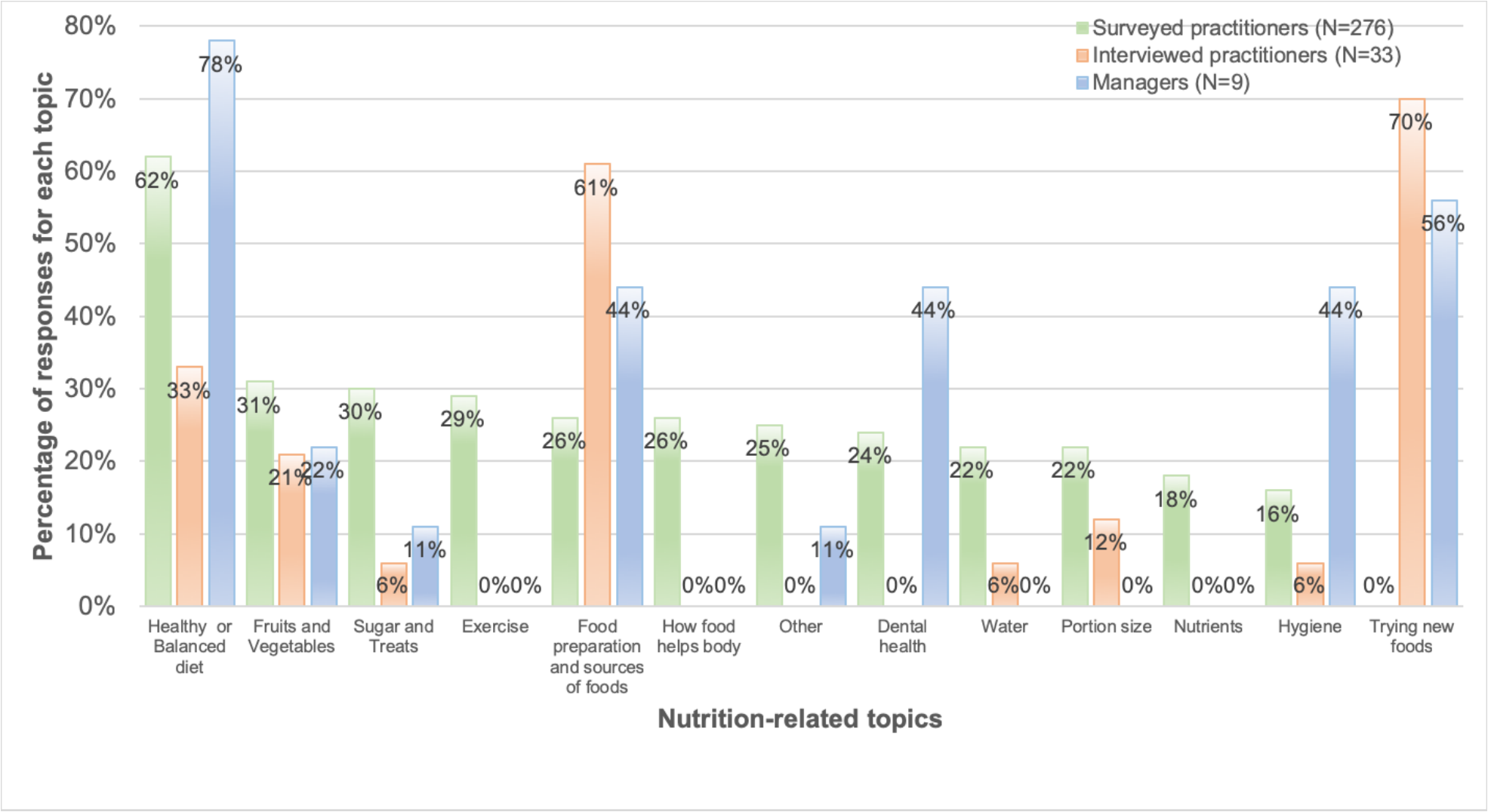


Table 8.2 shows learning activities practitioners associated with each nutrition-related topic. The above discussion and table of association led to the conclusion that most of the practitioners focus more on making children try new foods than providing the knowledge to make the choice. All the planned learning activities, such as games, role-play, gardening, food preparation, role modelling, were aimed at children trying new foods rather than gaining knowledge about them. Children could have gained knowledge in topics such as healthy diet, sources of foods, fruit and vegetables, portion size and awareness about sugar through activities such as food mapping, gardening, food preparation, food discussions, workshops and child-initiated activities, but they were not consistent across the visited settings and the learning outcome was not clear. The topics which could be directly associated with children gaining knowledge could have been nutrients and how food helps body as mentioned by surveyed practitioners, but no evidence of implementation was found.

The topics implemented needs planning and cooperation among the staff members, the next section discusses on how the activities were planned and implemented at the settings.

Table 8.2. Table of association between topics and learning activities as mentioned by practitioners.

Topics	Learning activities												
	Child-led activities	Cooking activities	Farm visits	Food Discussion	Food-maps	Games	Gardening	Market/ Shop visits	Peer modelling	Role play	Storybook reading	Teacher modelling	Work-shops
Dental health													√
Exercise													
Food preparation and sources of foods		√	√		√		√	√					
Fruits and Vegetables				√			√			√	√		
Healthy diet or Balanced diet	√								√			√	
How food helps body													
Hygiene													
Nutrients													
Other													
Portion size	√											√	
Sugar and Treats				√									√
Trying new foods	√	√				√	√		√	√		√	
Water													

8.2. Staff involvement in topic preparation and implementation

In all the visited settings, most of the managers (8/9, 89%) were confident nutrition education was a key part of their settings but the manager's role in planning the activities and the selection of topic was minimum; only in the case of special events such as a healthy week or a colour day, they got involved and discussed matters at staff meetings. Managers were actively involved with a cook in planning and developing the healthy menus for children at the settings, but practitioners' involvement was insignificant in this activity. The practitioners were not even updated about the nutritional significance of the meals provided in many settings leading to children missing on the opportunity to learn about the diet they were having on regular basis.

The staff members working in each area planned activities together based on the requirements of children. The interviewed practitioners (11/33, 33%) in visited settings planned topics together with other staff members "It is an interactive process, introduce a topic and then follow up", this was mentioned by interviewed practitioners in general how topics were dealt and when asked in particular about nutrition-related topics the interviewed practitioners mentioned that "Allergens/intolerance of food in children are dealt with … as teamwork".

The key person is a member of staff, who is assigned to every child in the setting to tailor their learning and care plans that suit that particular child's needs. The key person is also in-charge in developing a relationship with parents and providing adequate support for the development of child even at home (Department for Education (DfE), 2017a). Depending on the needs of the children the key person plans and coordinates with other staff to provide the nutritional learning experience for the child. The activities

planned by the interviewed practitioners (7/33, 21%) in the visited settings were more focused on children who were fussy eaters. The staff planning focused more on improving food acceptance by fussy eaters and managing the food allergies and intolerances. Games developed by Flavin, an interviewed practitioner, were mentioned by his colleagues in one of the settings, to encourage fussy eaters to try new foods.

Children trying new foods due to staff planning could lead to healthy habit development, but no evidence was found in staff planning to suggest any focus on nutrition knowledge development. Although special occasions were not mentioned by interviewed practitioners the managers' response indicated that planning and discussions takes place in the settings to plan these activities and these activities could aid in improving the knowledge of children. Next section discusses on utilisation of occasions to improve children's nutrition knowledge and how frequently nutrition-related topics were dealt at the settings.

8.3. Occasions and frequency

This section reports analysis of the data about opportunities for practitioners to enhance children's nutrition knowledge, how many occasions are being used by practitioners, and how frequently practitioners deal with nutrition education in their setting.

One of the main opportunities to create a learning experience for children could be when children are having a snack or meal at the setting, so, the data about food taken by children at the settings were collected. Nearly all of the children had some kind of food at the setting according to the interviewed practitioners (276,100%). Table 8.3 shows the number of surveyed practitioners who indicated that children had lunch or evening meal at the settings either provided by the setting or as a packed lunch.

Table 8.3. Number of surveyed practitioners reporting children had meals at settings.

	Lunch	Evening meal
Provided by setting	230 (83%)	82 (29%)
Brought from home	125 (45%)	15 (5%)

Table 8.4 shows the foods that children had at the setting on daily basis either provided by the setting or brought from home. The food items children have at the setting provide an opportunity for practitioners to talk about that particular food item and to improve children's nutrition knowledge about it. Interviewed practitioners (25/33,76%) mentioned mealtimes when questioned about opportunities to teach children about nutrition. Some of the topics associated with mealtime were portion size (4/33,12%) and hygiene (2/33,6%) and to develop children's acceptance of foods through self-service (4/33,12%). One of the interviewed practitioner mentioned about role modelling as discussed in the section 8.1. An opportunity to discuss with children about the healthy food was recognised by many of the practitioners but how it is utilised was not clear through learning activities discussion in section 8.1. The question of whether or not these opportunities are actually utilised by the practitioners and if knowledge about these food items is included in practitioners' choice of nutrition topics is discussed further.

Table 8.4. Surveyed practitioners (276) about what type of food items other than meals children have at settings.

Food items	Provided by setting	Brought from Home
Fruit	265 (96%)	75 (27%)
Milk	244 (88%)	32 (12%)
Biscuits	51 (18%)	33 (12%)
Cakes	26 (9%)	33 (12%)

Fruits and vegetables as discussed in section 8.1 is one of the main topics focused at many of the settings, although practitioners stress was on children trying new foods, children participating in learning activities such as gardening, food discussions, storybook reading and visits to market or farms might help them gain some knowledge about fruits and vegetables.

Milk was provided by settings according to 88% (244/276) surveyed practitioners but very few of them included under the topics children should learn about. Children under 5 years who attend approved day-care facilities are entitled to 1/3 pint of milk each day under Nursery Milk Scheme(Department of Health (DH), 2018). None of the interviewed practitioners or the managers either mentioned about milk as a topic or any activities could be associated with children learning about milk. An opportunity to talk to children about milk with children might be missed by the practitioners as none of them mentioned about it although children have milk at the settings on regular basis.

Biscuits and cakes were not mentioned as foods served or brought from home on day-to-day basis by fewer surveyed practitioners, but these could be utilised to initiate food

discussions about sugar content, portion size and also if they were healthy foods or not.

Various other occasions, which could be utilised, as nutrition learning opportunities, were identified by interviewed practitioners, including gardening, creative play, games and special occasions. As mentioned in the topics (section 8.1) gardening was not identified by many of the interviewed practitioners as an opportunity. Twenty-four out of 33 (73%) did not mention about gardening when asked about opportunities to promote nutrition education, although as a researcher I observed 80% of the visited settings (12/15) had gardens, making it a missed opportunity or practitioners were unable to associate gardening with nutrition education.

The other major opportunity (14/33; 42%) was during play in creative-areas like kitchen, shop etc. and also role-play such as pretending to be a dentist or doctor. Imaginative play, according to research aids in developing cognitive thinking and intellectual conceptual development (Bergen, 2002). Therefore, it could also aid in nutrition knowledge development, these kitchen and shop areas in the settings provide a chance for children to explore fruits and vegetables, providing an occasion for practitioners to enhance children's nutrition knowledge. Five out of 33 (15%) interviewed practitioners mentioned they found opportunity during story time to talk to children about healthy diet. Games, as nutrition learning opportunities, were mentioned only by 2/33 (6%) interviewed practitioners. The games mentioned by interviewed practitioners were developed by the staff members to encourage fussy eaters to try new foods. Though this approach was mostly to develop a food habit; the relation could be developed between habit development and nutrition knowledge. As importance of exercise is also

a part of nutrition education, games could be utilised as an opportunity but none of the interviewed practitioners mentioned about it but 29% (80/276) surveyed practitioners mentioned exercise as one of the five nutrition topics.

Special occasions and health-promoting weeks were mentioned by nearly 42% of the interviewed practitioners (14/33). Table 8.5 indicates that special occasions mentioned by practitioners were healthy week once or twice a year, and cultural and religious occasions. As mentioned in the topics and learning techniques (section 8.1) the included activities were different types of 'sources of foods and food preparation', 'water', 'fruits and vegetables' and similar.

Table 8.5. Interviewed practitioners reporting special opportunities to enhance children's nutrition knowledge

Special occasion	Interviewed practitioners (N=33)	Terms used by practitioners while talking about special occasions.
Cultural and religious occasions	6 (18%)	Harvest festival, Diwali, Chinese New Year, Christmas.
Special Healthy week activities	8 (24%)	"Seasonal… like in summer we did hydration week"; "We did a healthy eating week a few months ago and it was interesting to see how involved children were". "Healthy week… we made smoothies". "Healthy me ... last week."

Having explored the various occasions in the settings, which could be utilised as opportunities to enhance children's nutrition knowledge, the next paragraph is set out to analyse the data and discuss how frequently practitioners dealt with nutrition

education in the settings. Although the interviewed practitioners mentioned opportunities such as imaginative play and mealtimes, these being utilised couldn't be backed up by triangulation with the mentioned learning experiences.

Almost 98% (271/276) of the surveyed practitioners dealt with nutrition education in their settings. Half of the surveyed practitioners (139/276,50%) did so on a day-to-day basis. About 19% (52/276) surveyed practitioners dealt with the topic only occasionally, as indicated in table 8.6. Interestingly 8 of these practitioners, who responded they might deal with nutrition education, when asked how frequently it was done responded as never. The chi-square test was done to examine if there was any regional difference or type of settings in the frequency of dealing with nutrition education and the results showed there was no association between the two variables.

Table 8.6. Frequency at which healthy diet topic is dealt by surveyed participants.

How often practitioners deal with nutrition topics.	Number of surveyed participants (N=276)
Day to day basis	139 (50%)
Occasionally	52 (19%)
Weekly	47 (17%)
Monthly	21(8%)
Never	13 (5%)
Fortnightly	4(1%)

Although there were day-to-day occasions in the settings for the practitioners to utilise as opportunities to develop children's nutrition knowledge only 50% of the surveyed practitioners said they were dealing with healthy diet topics on day-to-day basis. However, if nutrition education was done at regular intervals it might be still beneficial for children (Byrne & Nitzke, 2002; Gripshover & Markman, 2013; Sigman-Grant et al.,

2014; Weber et al., 1999). The reasons for 5% (13/276) surveyed practitioners not dealing with the topic were given as children too young, English as Additional Language (EAL) children, but as discussed in previous chapter (Chapter-7) training and resources could aid in overcoming these issues.

Dealing with nutrition-related topics occasionally could also be inferred through discussions in the previous sections 8.1 and 8.2 as the learning activities were not consistent across the settings and also there were not much planning discussions going on except during special occasions. Most of the surveyed and interviewed practitioners dealt with nutrition education using various occasions available, now how successful they were in educating children about nutrition could be comprehended in the next chapter by analysing the methods of assessment and children's nutrition knowledge test.

Summary

All the 13 nutrition-related topics suggested by the practitioners to include in children's nutrition education could also be signified important through research, however, evidence was not found that all these topics were dealt in all the settings. Some of the topics such as nutrients, exercise and how foods help the body were not mentioned in any of the visited settings. The interviewed practitioners were focusing more on children trying new foods but there was clear evidence that children were being given more information as apart of nutrition education. The practitioners were creating learning experiences for children: how food was grown- gardening, how the foods differ in appearance and taste- role-play shop, portion control – child led plates, which was better food choice – food discussions; but there was no consistency across the visited

settings and most of the practitioners also did not mention them as nutrition-related learning outcomes.

Staff planning and discussions were narrowed down to only planning for fussy children to try new foods. The managers and staff discussions took place only to organise special occasions. The lack of communication among the managers and staff was evident in not providing the nutrition information to children even though healthy food was served at the settings. However, staff collaboration was found in all the settings to implement the learning activities.

Children taking at least one meal at the setting and exposure to various kinds of food items gives an opportunity for the practitioners to deal with nutrition-related topic. Nearly 95% of them mentioned that they dealt with the topic at regular intervals with 50% of them claimed they dealt with it on day-to-day basis. But no evidence was found through mentioned learning experiences that there was either consistency across the setting or regularity in frequency. The practitioners at the settings had ample opportunities to create learning activities for children in relation to nutrition at regular intervals but evidence was not found that nutrition learning activities to improve children's nutrition knowledge were implemented frequently. The inconsistency and infrequency across the settings in the topics dealt would not directly relate to learning goals of EYFS unless they were recorded, but as analysed in the previous chapter (Chapter 7) practitioners mentioned that they don't record any observations regarding nutrition education. So, it could be summarised that emphasis at the settings was on making children try new food and no evidence was found on the level of nutrition knowledge associated with it.

Chapter 9. Evaluation of nutrition education

“Assessment plays an important part in helping parents, carers and practitioners to recognise children’s progress, understand their needs, and to plan activities and support.” (Department for Education (DfE), 2017a, p. 13)

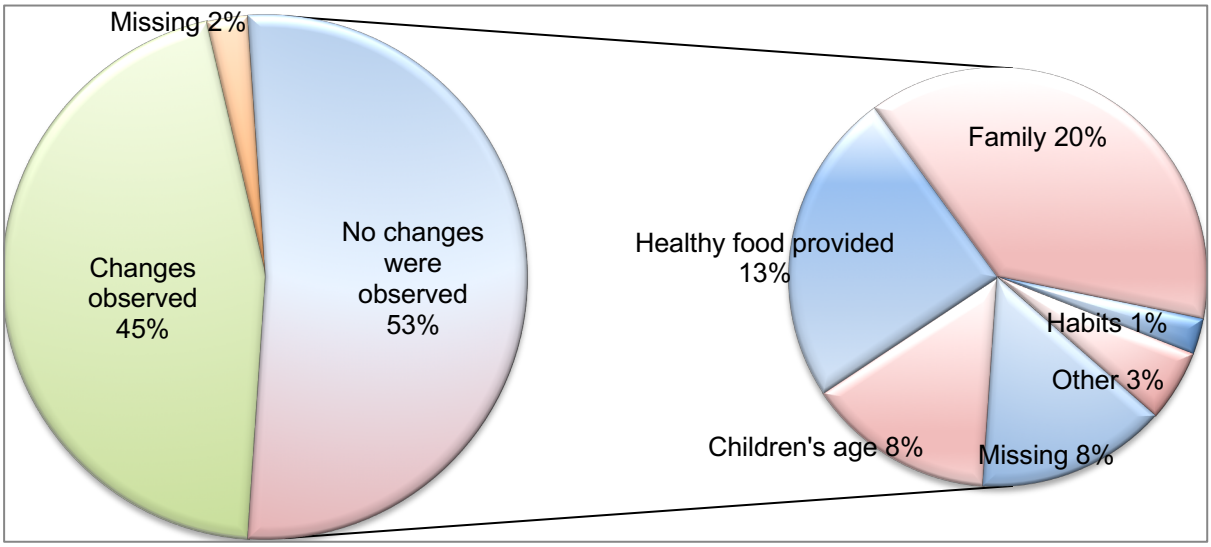
Evidence about the impact of nutrition education on early year children’s nutrition knowledge is analysed in two sections in this chapter. The first section is based on the responses given by practitioners along with the recorded observations practitioners had made as a part of children’s nutrition knowledge assessment. The second section analyses the nutrition knowledge test collected by researcher (me) from children in the sample settings.

9.1. Practitioners’ observations

The nutrition knowledge gained by children could be reflected in their food choices to certain extent, whilst other factors may also influence food choice it could still be used as an indicator of children’s knowledge gain if the choices changed significantly and they are consistent. As some of the comments made by children in the knowledge test (section 9.2) indicate the choices children make might not reflect their knowledge, however, the practitioners were asked if significant changes in children’s food choices were observed after nutrition-related topic was dealt at the settings; children might not make the healthy choices, but children’s comments associated with the choices could provide an insight for the practitioners who work in close relation with children. About 45% (125/276) of the surveyed practitioners claimed that they observed significant changes in children’s food choice after they were educated about nutrition. Around 53% (144 out of 276) mentioned they did not observe any significant changes in children’s food choices. Out of these 144 (who mentioned there were no changes),123 surveyed

practitioners provided reasons which were shown in the pie of pie chart (Figure 9.1). The main reason mentioned by 20% (55/276) surveyed practitioners was family's influence, the experiences shared by the interviewed practitioners and managers about family influence on children's food choice was explained in section 7.5.

Figure 9.1 Pie of pie chart showing changes observed by surveyed practitioners in nutrition behaviour and reasons for no changes in children's behaviour.



The reason given by 13% (35/276) surveyed practitioners was that children had only healthy choices to choose from, as all the food provided at the settings is healthy and also guidelines for lunchboxes at many settings restrict the type of foods allowed. Three of the visited settings provided documents related to institute's nutrition policy which provided a clear insight on the type of foods permitted and not permitted at the settings but did not provide any guidelines on their policy in educating children about nutrition.

Twenty-one out of 276 (8%) surveyed practitioners mentioned that children's age was the factor influencing, although 19 out of them mentioned below 5 years of age was ideal for children to start learning about nutrition (section 7.3). The comments provided

by surveyed practitioners as further explanations were “They do immediately after learning but they slip once they see something they want or forget.”; “Lack of understanding, however, it has been approached and the children make comments about being healthy however the changes are more going to be whilst they are older. If a parent of a teacher offers a biscuit, is a 3-year-old really going to refuse it?”; “it is varying from child to child some really take it in and make changes when they have choices, but others ask questions but may still choose a treat when offered.” These comments support the view expressed in chapter 8 that children eating behaviour and children learning about healthy diet could be two unrelated factors at this phase of learning but could become intervening factors in habit formation as they grow.

Other reasons given by (8/276,3%) surveyed practitioners were: economic background- lack of choice or limited choice; peer influence; advertising an easy availability of sugary temptations; inconsistency at settings- “Not consistent. Not done as a theme and only carried out by one practitioner”. Four out of 276 (1%) surveyed practitioners mentioned children’s food preferences as the reason for not observing any changes. The explanations mentioned were children preferring cakes over fruit or some children dislike for fruit or vegetables. Although these observations may not provide the full extent of children’s nutrition knowledge, they could provide an insight on it.

In early years settings, assessment, in general, is done through recording and maintaining observations for each child.

> Ongoing assessment (also known as formative assessment) is an integral part of the learning and development process. It involves practitioners observing children to understand their level of achievement, interests and

> learning styles, and to then shape learning experiences for each child reflecting those observations.(Department for Education (DfE), 2017a, p. 13).

So, practitioners were asked if they recorded any of the observations with regard to nutrition education.

Out of the 125 surveyed practitioners, only 73 maintain a written record of the observations, which is only 26% of the total (276) surveyed practitioners. Table 9.1 shows that 13% (37/276) surveyed practitioners only do temporary feedback such as end of the day oral feedback to parents. About 64% (21 out of 33) of interviewed practitioners were positive in recording the healthy diet observations in children's learning journal. However, 11(33%) out of interviewed practitioners expressed they record only when child tries new foods or when a child started newly at the nursery to record their likes and dislikes. Twelve (36%) of the interviewed practitioners mentioned they did not make any observations related to healthy diet. The low level of recorded observations could affect the planning and implementation of nutrition education in the settings, as there might be no reference to what is done or what is needed to be done.

Table 9.1. Table indicating if the nutrition-related observations are recorded or not by the Surveyed practitioners

Observations recorded	Surveyed practitioners (N=276, n=125)
Written record	73 (26%)
Oral report	37 (13%)
No report or record	15 (5%)

These observation records are referred to as learning journals in this research study as in general practice. Learning journals not only aid practitioners in understanding the

level of children's knowledge and skills but also in planning future activities to improve that level.

No substantial data could be collected in relation to nutrition education through learning journals observations by the researcher. The learning journals of children were difficult to access in many settings due to the settings' policies (only 2 out of the 15 settings permitted research access to the learning journals). Although these two settings permitted me to examine the learning journals, there were no nutrition education related observations for the children who participated in the study. During the face to face interviews, the nutrition-related explanations by children were quoted by 7 out of 33 (21%) interviewed practitioners when asked about most memorable incidents in nutrition education. Table 9.2 represents these quotations. These quotations provided by interviewed practitioners show that children could express their nutrition knowledge in other forms during various activities and proper record of these observations could be utilised in enhancing the children's knowledge further.

Table 9.2. Children's knowledge quotes as quoted by interviewed practitioners.

Children's knowledge cited by practitioners	"Fruits are not like chocolates, they are not having sugar." "We should eat our carrots they fight out germs" Children loved making soup and one child loved it in particular and her knowledge was really good on preparing. When asked how to be healthy "5 a day – 8 glasses of water" Boy pointing out "no sprinkle of sugar" on dessert so healthy. "We need to take water, or we will get dehydrated," while working in the garden on a hot day.

9.2. Nutrition Knowledge Recall test

This section mainly states the responses of children for the nutrition knowledge test to aid in discussion and develop conclusions later. In the first section, the surveyed practitioner's responses on the assessment topics were discussed that were used as the basis to develop the nutrition knowledge test for children. Children's responses for the topics included in the field notes are analysed and discussed in sections along with the variable influence wherever applicable.

The nutrition knowledge of children in a group of four to five were tested using picture cards. The picture cards were laid on the table in front of the children, and researcher asked questions to which children either responded orally or showed their choice through picture cards. The responses were recorded in the prepared field notes sheet (Appendix 4). The field notes had ten enquiries each with anticipated answers grouped into columns for maintaining the consistency in marking the responses (Chapter 5). The responses for nutrition knowledge test, which was conducted with children, were discussed in the following sections based on the questions and each response was marked into four different groups, one of which is 'no response'. In the 15 visited settings, 106 children agreed to participate in the study with their parental consent. The process of collecting data and its reliability is explained thoroughly in section 6.2. along with the attributes of the participants from each type of settings and the other variables.

9.2.1. Topics suggested by the surveyed practitioners for children's assessment

The topics that were suggested by the surveyed practitioners to test children's knowledge were categorised into the same topics suggested for five important topics to include in children's learning experience. The chi-square test was conducted

between the important topics suggested to be included in children's learning activities and the topics used to test children's knowledge and found there was no association between the variables. The lack of association between the two topic lists indicate that the topics practitioners suggested must be taught at the settings does not have relation to the topics practitioners suggested to test children's knowledge. The number of surveyed participants who suggested topics for testing children's nutrition knowledge were listed along with those who suggested teaching topics in the Table 9.3. Although the chi square test indicates there was no association between the testing and teaching suggestions, the rank order suggests that most of the surveyed practitioners considered healthy diet and balanced diet as the most preferred topic and also hygiene was suggested by least number of surveyed. There was a slight shift in the ranks for topics which were considered important for teaching and testing. The major difference was in the topic 'exercise' which was suggested as important teaching topic by more than 25% of the practitioners but while suggesting for testing only 3% suggested this topic moving it from upper half of rankings to the lower.

The topics selected to include in the nutrition knowledge test were healthy and unhealthy foods and balanced diet, fruit and vegetable, portion size, dental health, sugar and treats, and water. These topics were selected not only based on the surveyed practitioners input but also based on research review. The importance of the topics in early years nutrition education was discussed in Literature Review (Chapter 2) and also in Chapter 8 (Implementation of nutrition education). Healthy and balanced diet was the topic suggested by 29% (125/276) surveyed practitioners and 19% (84/276) suggested how food helps our body. Healthy diet and balanced diet had two questions which were sorting out foods into healthy and unhealthy and choosing foods

to make a balanced diet. ‘How food helps the body’ was included in the above two questions as one of the response to the questions, that is if children were able to explain why they sorted foods as healthy or unhealthy or why they have chosen particular foods for their balanced diet.

Table 9.3. Nutrition knowledge topics for testing and teaching children

Test topics	Responses for testing children (N=276)	Rank order (testing)	Rank order (teaching)	Responses for teaching children (N=276)
Healthy diet and Balanced diet	125(29%)	1	1	170 (62%)
How food helps body	84(19%)	2	5	73 (26%)
Fruit and Vegetable	37(9%)	3	2	85 (31%)
Sugar and treats	37(9%)	4	3	83 (30%)
Preparation and source	27(6%)	5	6	72 (26%)
Other	27(6%)	5	7	68 (25%)
Water	25(6%)	7	9	60 (22%)
Portion size	21(5%)	8	9	60 (22%)
Nutrients	19(4%)	9	11	50 (18%)
Dental health	14(3%)	10	8	67 (24%)
Exercise	12(3%)	11	4	80 (29%)
Hygiene	4(1%)	12	12	44 (16%)

As suggested by 9% (37/276) of the surveyed practitioners, fruit and vegetable included was included in the test with one direct question, if they know what five a day was, however other questions, such as sorting foods into healthy and unhealthy, also provided an insight into the topic. Five a day was included in the test as it was a concept promoted by the health department for more than a decade. (Mosley, 2013; National Health Services(NHS), 2015b).

Sugar and treats topic as suggested by 9% (37/276) of the surveyed practitioners was included with two questions. The questions were based on the number of treats a child can have in a day and if children could identify the difference between various treats. In recent years the consumption has increased drastically, especially the hidden sugar content so these questions were aimed at capturing how aware were children about sugar and its various forms (Kranz & Siega-Riz, 2002; Y. Lee & Joo, 2016; Lim et al., 2009; 2015).

Around 6% (25 out of 276) of the surveyed practitioners suggested water as one of the topics on which children should be assessed. Two water-related questions were included in the test, their choice of drink when thirsty and how many glasses of water should they have in a day. As discussed in earlier chapters (2&8) sugar added beverages were identified as causes for various health-related problems and also medical consequences of dehydration could be avoided by water intake.

Portion size (21/276, 5% surveyed practitioners) was assessed using two questions, number of meals and meal size. Koletzko and Toschke (2010) in their review of research studies found that it was prudent to suggest small sized regular and frequent meals for children as a preventive approach to tackle nutrition-related health issues.

The eleven questions included in the Nutrition Knowledge Recall test were analysed along with the source of knowledge in following sections in the order they were implemented in actual test. The reference question in each section represents the original structured question and further explanation was given on the slight variations if adopted from group to group during the data collection. The test was more an

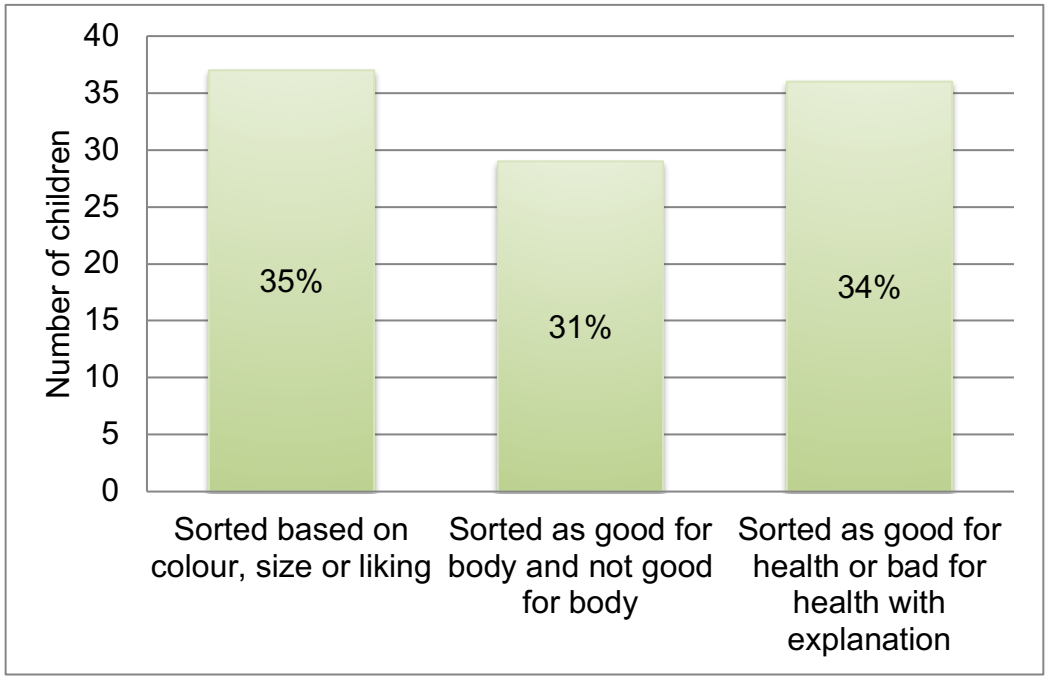
interactive session the questions were asked were based on the children's responses, as explained in a section of Second phase methodology chapter (section 5.1.2), and a field notes was prepared with three anticipated answers and the children's answers were reflected into these projected answers.

9.2.2. Classify or group foods into healthy and not healthy

Reference Question: Please select five healthy food picture cards and five unhealthy food picture cards.

The group of four to five children were asked to select any five food picture cards that children think were healthy and then repeat the same exercise to select unhealthy foods. The question asked had three estimated answers: Sorted based on colour or size or liking or taste; Sorted into healthy and unhealthy or good for body not good for body; Sorted into healthy and unhealthy or good for body not good for body and could explain why it's good or not good for our body.

Figure 9.2 How children classified foods into healthy and unhealthy groups (N=106).



Out of the 104 valid responses, 37(35%) sorted them based on likes and dislikes, 29(31%) were able to sort them into healthy and unhealthy but could not give their reasoning behind it, 36(34%) were able to explain why they thought that particular food was healthy or not by explanations as shown in the table 9.4. Nicholson et al. (2017) in their study concluded that children are more likely to choose healthy foods if they were able to categorize them, however when multiple dimensions should be considered children were not able to classify them into healthy or unhealthy. This finding could provide the clarification for children's rationalisations on certain foods as healthy even though they were not the healthy choices. This observation reinforces the need for proper guidance for children to understand the complexity of classification and base nutrition education on cognitive development to make informed food choices this view was also emphasised in studies (Başkale et al., 2009; Gorelick & Clark, 1985; Sigman-Grant et al., 2014).

Table 9.4. The comments used by children to explain about

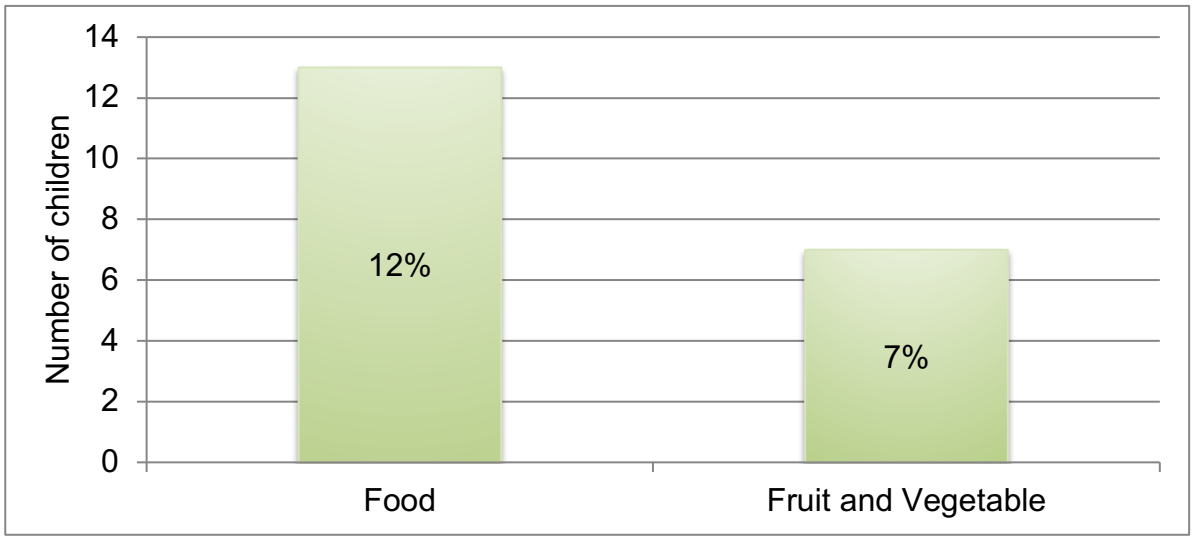
"Burger has sugar."
"Cake has sugar."
"Cake has sugar in it."
"Chicken is protein."
"Chips is healthy because it has potatoes and ice-cream is good as it has milk in it."
"I think it [ice-cream] has sugar."
"Because it [ice-cream] has sugar it makes you fat."
"Fish is good it gives brain power."
"Fruitcake is healthy as it has fruit in it."
"Hot dogs are not healthy as they have sugar in them."
"If you eat carrot you can see in dark."
"Healthy, olive on pizza."
"Some say popcorn is not is not healthy."
"They [hot dogs] are not good for your tummy."
"They are good because they are fruits."

9.2.3. Five a day

Reference Question: Do you know what 5-a-day is? was the question asked to the group of children.

The three anticipated answers were: Food; Fruit and vegetable; Fruit and vegetable with an explanation.

Figure 9.3 Five a day (N=106).



Only 20 children responded to this question and there was no response from other 86 children. Out of the 20, 7 (7%) said ‘five a day’ means fruit or vegetable whereas remaining 13 (12%) showed random food picture cards such as toast or chicken. Some of the expressions children used to explain five a day were "healthy"; “4 vegetables and 1 fruit”; “cucumber, pineapple for breakfast”; “lots of vegetables and fruits”; “pears, apples”. Despite government initiative to promote five-a-day as a healthy eating concept for more than a decade, this finding indicates that the awareness levels of children regarding five-a-day was very low. The reasons for children not widely aware of the concept should be further investigated, however the studies conducted on parent’s and general public about five-a-day also indicate lack complete knowledge about the concept (Buttriss, 1997; Buyuktuncer, Kearney, Ryan, Thurston, & Ellahi,

2014; M. K. Campbell et al., 1999). So, it might be advantageous to start creating awareness in early years and further develop in further years.

9.2.4. Number of meals or snacks we can have in a day

Reference Question: How many number of meals we can have per day?

Number of meals we take per day was the topic discussed with children during the test. The three estimated answers were: as many times, as we want or eat when hungry or number less than 3; 3 meals; Have small meals every 2hrs or 3hrs.

Table 9.5. Responses for how many meals we take in a day.

Number of times we take food in a day	Number of children(N=106)
On demand	27(26%)
3 meals a day	55(52%)
At regular intervals	3(3%)

As shown in the table 9.5, 80% (85/106) of children responded to this query and nearly half of the total (55/106,52%) said they have 3 meals a day. Three out of 106 (3%) children counted the snack time also and mentioned they had about 5 times, in this study, it was considered as small meals every three hours, which meets the recommendation of researchers as reviewed by Koletzko and Toschke (2010). Majority of children did not count the food they take in between meals although discussion with the children indicated most of the children did have food between the meals. Around 26% (27 of 106) gave a random number like one or ten and some of them said whenever hungry.

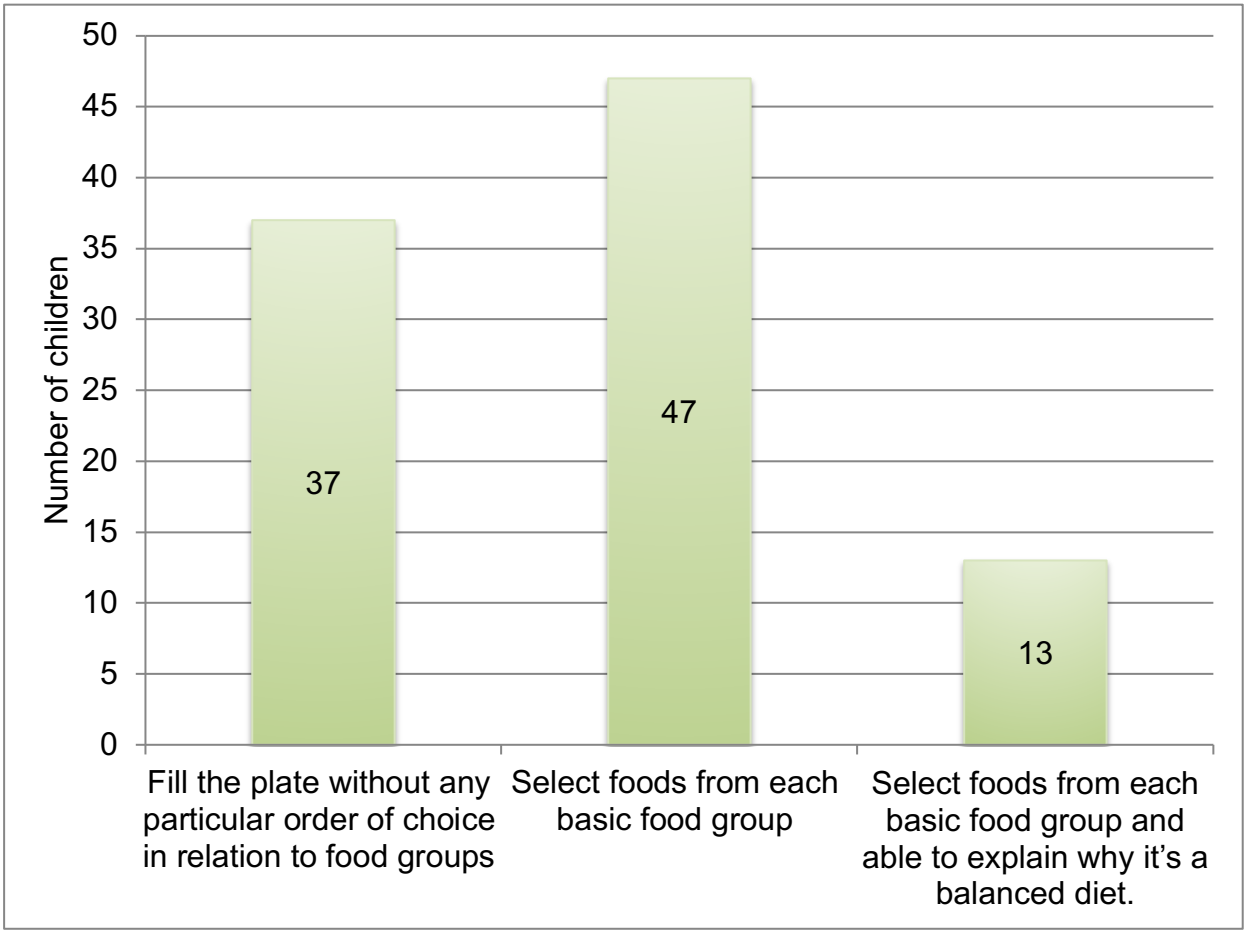
9.2.5. Balanced diet

Reference Question: If you are hungry what healthy foods you would select to eat?

Children were enquired 'Imagine you are hungry now and needs to select healthy foods for your plate what would you select?' and discussed about the choices and how it would be healthy. The question directly did not include terms such as balanced diet or food groups but based on the discussion with children about their choices helped me in confirming their answers.

The three expected answers were: Fill the plate without any particular order of choice in relation to food groups; Select foods from each basic food group; Select foods from each basic food group and able to explain why it's a balanced diet.

Figure 9.4 Balanced diet (N=106).



The bar chart (Figure 9.5) represents the 97 children who responded to the answer and there were 9 no responses. Many of the children 47 out of 106 (44%) picked up food from various food groups to make a balanced diet but they could not explain why those foods were chosen. About 35% (37 out of 106) of the children randomly filled the plate, this was explored by the researcher by asking them why they have chosen those foods. Thirteen out of 106 (12%) of them were able to explain their choice, some of their explanations were “Raspberries and raisins are healthy as they have good sugar”; “Soup is healthy”. There were also conversations in between children to decide “Burger is healthy as it has healthy stuff in it.” pointing to the vegetables in the burger picture. When another child indicated burgers were not healthy, the logic drawn by first child was “But it has no sugar”. So, this again highlights the lack of clarity in children when they have to decide based on multiple dimensions (section 9.2.2).

9.2.6. Portion size

Reference Question: How much can you have for each meal? (it is based on balanced diet question)

This question was carried out as an extension to the previous query about balanced diet; children were asked how much of the food they can have at a time or in cases where too little or too much was selected I enquired children about the size of their choice to understand the amount children think is appropriate for a meal. Depending on the choices they make and the size of the choice the responses were recorded. There were limitations to the query as plates used were imaginary; there could have been better ways to approach this query which are reflected in the limitations (section 10.7).

The three anticipated answers were: Fill the plate; Small portion to medium portions; Small portions from all food groups.

Table 9.6. Portion size responses

Portion size	Number of children (N=106)
Fill the plate (selected more food)	40 (38%)
Small portion to medium portions	46 (43%)
Small portions from different food groups	4 (4%)

As shown in table 9.7 only 4 out of 106 (4%) children made a small portion choice from different food groups. Forty-six out of 106 (43%) decided to have reasonable portion size and save the rest for later. Around 38% (40 out of 106) decided they could have everything on their plate at a time.

Increase in portion-size was considered as the main cause for increase in the nutrition-related issues such as childhood obesity calling for interventions and promotion of strategies to control the portion size (Fisher & Kral, 2008; Looney & Raynor, 2011; McConahy et al., 2004; Small et al., 2013; Weber et al., 1999).

9.2.7. Care of teeth

Reference question: How can we keep our teeth healthy?

Children were asked how they took care of their teeth. The three answers expected for the topic were: Brush daily; Brush twice daily; Brush twice daily and eat less sweets and have less fizzy drinks.

Table 9.7. Care of teeth.

Care of teeth	Number of children (N=106)
Brush daily	28 (26%)
Brush twice daily	52 (49%)
Less sweets and fizzy drinks; Brush twice daily.	16 (15%)

About 64% (68/106) of the children were particular in responding we need to brush the teeth twice daily; the other (26%, 28/106) children's responses were not specific about

how many times they brush. 16 out of the 68 children added more information on how to look after our teeth. Some of them were about having fewer chocolates and the other comments were like “Have lots of water”; “Milk makes bones strong and teeth grow”.

About two-thirds of the children mentioned only brushing as a way to take care of teeth, whereas studies show that dental caries in preschool children was caused due to dietary reasons and recommends nutrition education (Chan et al., 2002; O'Sullivan & Tinanoff, 1996 ; Oliveira, Sheiham, & Bonecker, 2008; Tinanoff, 2005; Tinanoff & Palmer, 2000).

9.2.8. Chocolates or treats quantity per day

Reference Question: How many number of treats you can have in a day?

The three probable answers for this query were: Treats more than 2 a day; Treats one or two a day; Treats not every day only occasionally.

Figure 9.5 Bar chart showing children’s view on how many treats they can have in a day(N=106).

Nearly 60% (63/106) of children said only one or two treats per day are good for health. Around 26% (28/106) mentioned they could have more than two treats a day. Very few children 6% (6/106) responded that treats must be taken only occasionally. Some of the interesting comments children made during discussing treats were “I know lollipops are not good, I like them”; “No sticky chocolate cake, your teeth will make sticky” and “Too much you will have tummy ache…chocolate little bit”.

9.2.9. Sugar or Chocolates are bad

Reference Question: What do you think Sugar or Chocolates are bad?

This query was asked as a situation showing two pictures of different treats such as a chocolate and a cake or ice-cream and chocolate. The children were asked if they just had one of them and an adult (teacher or dad or mum) walks in and offers the other, what would be their response, depending on their answer judgment was made by the researcher if they could identify both of them were high sugar containing substances so are similar or would treat them as different.

The three expected answers were: Sugar and Chocolates are different; Sugar and Chocolates are similar; Sugar and Chocolates or Treats are similar and able to explain why they think they are similar.

Table 9.8. Differentiation between treats

Treats per day	Number of children (N=106)
Each treat is different	45 (43%)
Treats are similar	34 (32%)
Treats are similar and able to explain why they are similar	5 (5%)

About 43% (45 out of 106) responded they could have both as they are different; 34 out of 106 (32%) said they might say no as both are treats. 5 out of 106 (5%) of children could give further explanations; “Because they have high sugar” and “Hurt teeth”; for why they think the two are same. The child who commented “I know they are naughty, I like them” was able to clarify that he has the knowledge to differentiate them but might not show it in implementation. Other comments given by children discussing this topic were “chocolate when melted is good for you” and “once you grow up you can have healthy stuff to eat”.

Cognitive abilities of the pre-schoolers play a key role in this finding, as the foods were low contrast foods and need to consider various factors to make a decision (Nicholson et al., 2017). Nearly 16% children who said they will have only one or two treats a day responded they might have both as they were unable to differentiate.

9.2.10. Best drink to have when thirsty

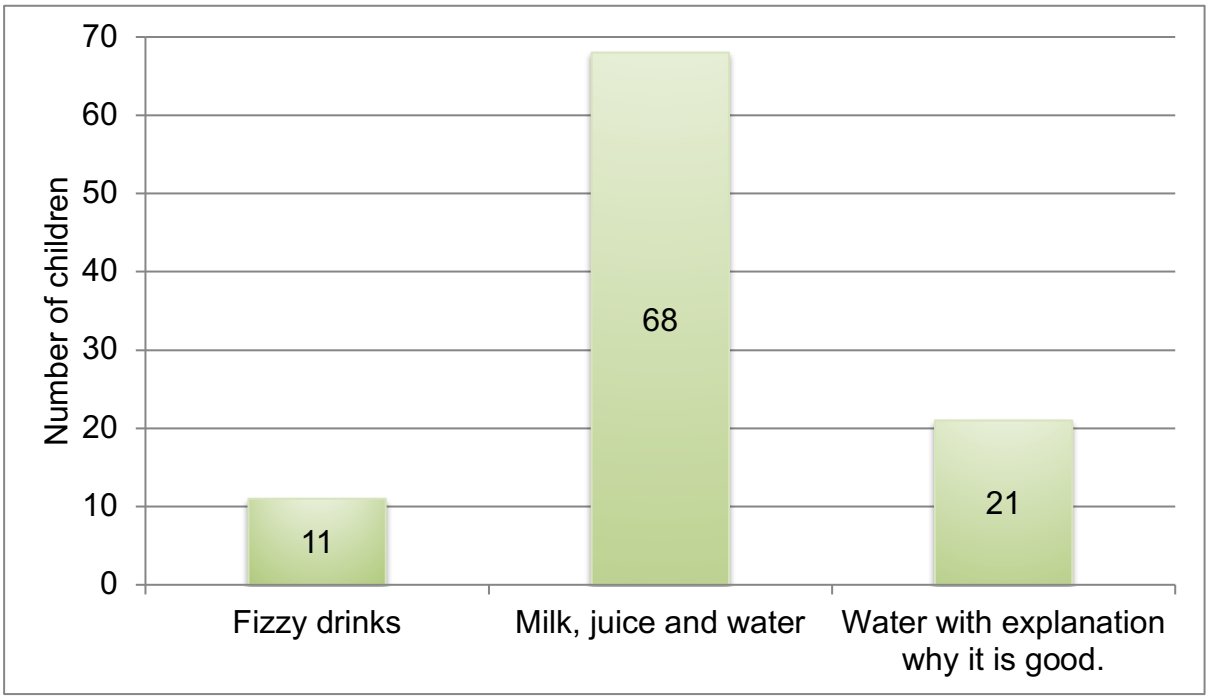
Reference Question: What drink is good for our health?

‘Now if you were thirsty what is the healthy drink to choose from the picture cards showing different types of drinks’ was the next query.

The three anticipated answers were: fizzy drinks; Milk, juice and water; Water with an explanation why it is good.

Only 10% (11/106) selected fizzy drink as the best drink to have when thirsty; 83% (89/106) said water, milk or juice was good drink to have. Around 20% (21/106) of them were particular about water and said it was good for health.

Figure 9.6 Best drink to have when thirsty (N=106).



9.2.11. Number of glasses of water per day

Reference Question: How many glasses of water should we have every day to be healthy?

The question was based on the query 'number of glasses of water you would have in a day?' The three probable answers were: Water less than 4 glasses; Water 4- 6 glasses; Water more than 6 glasses.

Table 9.9. Number of glasses of water per day.

Number of glasses of water per day	Number of children (N=106)
Water less than 4 glasses	36 (34%)
Water 4- 6 glasses	24 (23%)
Water more than 6 glasses	19 (18%)

Glasses were used as the method to measure children's water drinking habit as in general practice water at the settings is provided in a jug accompanied with plastic tumblers. The researcher is aware that children could use bottles to drink water but as bottles vary in sizes and cannot be generalised, they were not included in the query. Responding to this query ,36 (34%) children said they might have less than 4 glasses of water a day; 24(23%) have at least 4 glasses of water a day and 19(18%) have more than 6 glasses of water. The comment one of the child when talking about water was "If you don't drink water you will die". Only 79 children responded to the question and it was observed children had difficulty in comprehending the number of glasses they had for the whole day.

9.2.12. Source of knowledge

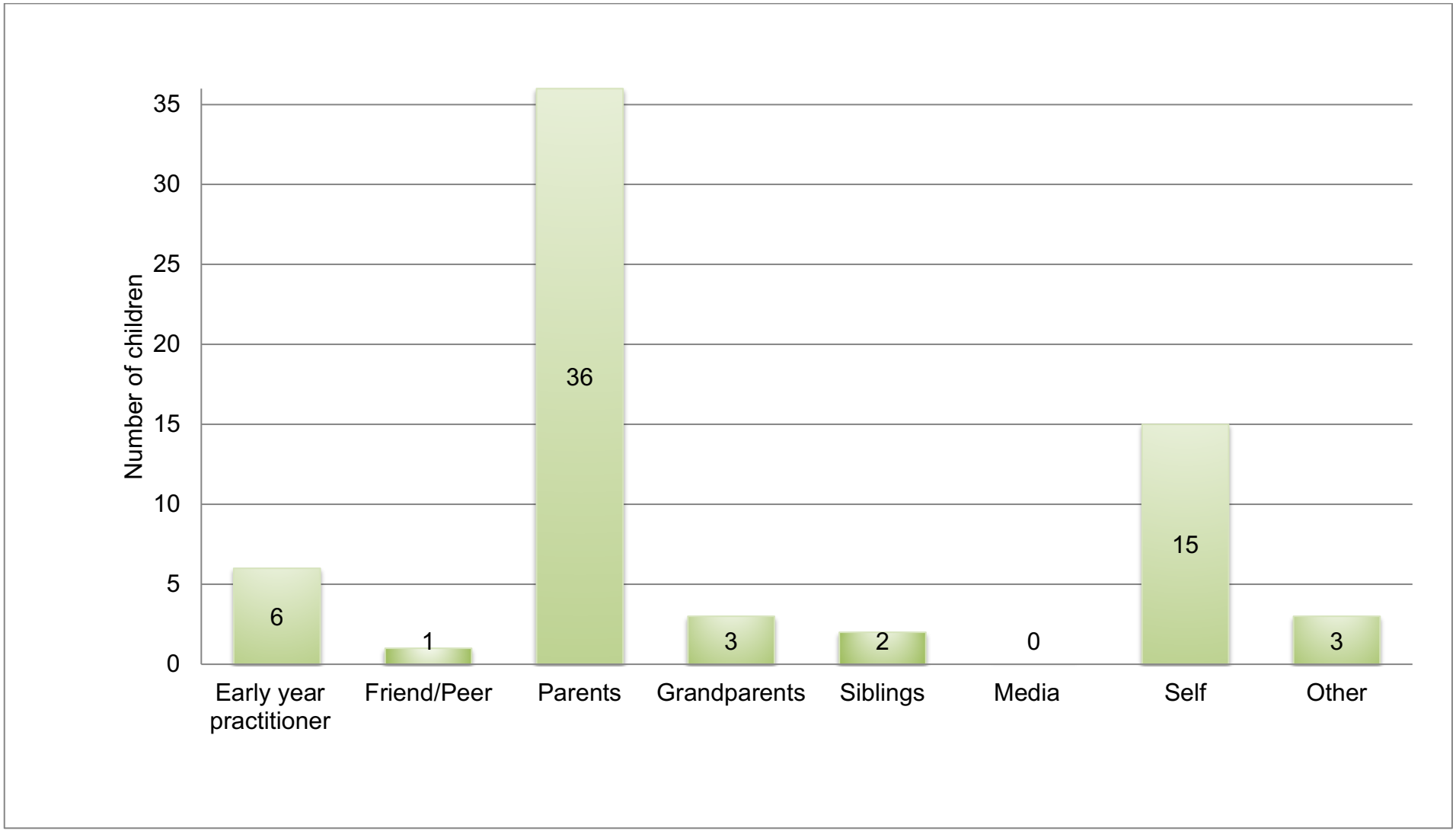
Reference Question: Who told you about these things?

Children were asked who gave the information they have shared with me and the valid responses are represented in the bar chart (Figure 9.8). 34% (36/106) children mentioned they acquired the knowledge from their parents and 14% (15/106) children said they learnt themselves. Around 6% (6/106) mentioned their early years teacher taught them. About 3% (3/106) mentioned they knew it from their grandparents and equal number stated they had information from other sources such as dentist, aunt. About 2 % (2/106) got the information from their siblings and one of them (1%) learnt it from their friend.

VanderBorght and Jaswal (2009) 'Three-, four-, and five-year-olds (N 565) were asked to decide whether an adult or child informant might better be able to answer a variety of questions about the nutritional value of foods and about toys. Children of all ages chose to direct the food questions to the adult and the toy questions to the child. Thus,

there are some kinds of information for which pre-schoolers expect that a child might be a better informant than an adult.' So, there was no surprise in a majority of children (46%) mentioning an adult as their source of their information but the concern was only 6 children out of 106 mentioned their teacher or practitioner at the setting told them about healthy food. The number of responses did not increase even after asking a leading question 'did anyone at the school tell you about healthy foods?'

Figure 9.7 Bar chart showing children's source of knowledge(N=106).



Summary

Around 45% of surveyed practitioners did observe changes in children's food choices after the nutrition-related learning activities but only half of these practitioners claimed they maintain a written record of the observations. The main reason given by 20% of the 53% surveyed practitioners who did not observe any changes was family and 13% mentioned that as the settings only provide healthy food there was no chance to show any improvement. The 8% of the practitioners who mentioned children were too young to express any food choice changes expressed that children were not consistent over time and also not similar across children. The other reasons given were economic reasons, children's likes and dislikes, and peer influence.

Only 26% of the surveyed practitioners claimed to maintain written records of the observations. However, 64% of the interviewed practitioners mentioned they recorded the observations in children's learning journals but 33% of them said that they recorded only when children tried new foods. The research access was not granted in most of the settings and in the two instances where the access was granted no records were found for the children who participated. So, the assessment methods of the practitioners could not be established clearly, but there was no objective evidence seen that supports the practitioners' claims that relevant observations are recorded.

The nutrition knowledge test conducted with children was developed by the input of surveyed practitioners. The test revealed that nearly 50% or more children had basic knowledge about all the topics included except about five-a-day and finding similarities between treats. Most of the children selected water or milk as best drink to have when thirsty but when it came to the amount many of them were unable to comprehend. The

same pattern was found when they were asked about number of meals a day but were able to mention about brushing twice a day and having one or two treats a day. Further investigation is needed in these responses- higher percentage of children stating about brushing and treats were due to frequent exposure to the repetition and vice versa were unable to conclude about meals and water as the information was not provided frequently. Children were not always correct in deciphering the logic behind their thoughts about categorizing the complex foods and need more guidance and understanding. When it came to the source of children's nutrition knowledge families (39%) played a major role with parents (34%) providing most of the knowledge. Only 6% of the children mentioned early years practitioners were their source of knowledge.

Chapter 10. Discussion and Conclusions.

In this chapter discussions from previous chapters have been consolidated and discussed to conclude with answers to the research questions. The key aspects to draw inferences for each research question are discussed followed by the conclusion for each research question, aimed at understanding the state of nutrition education in the early years settings in England. Firstly, in section 10.1, the views of early year professionals on nutrition education is discussed and the answer to RQ1 is inferred. The next section (10.2) includes discussion about staff planning and implementing nutrition-related topics in early years settings and the RQ2 is discussed. Section 10.3 includes discussion about the teaching and learning experiences and their outcomes, followed by inferences to answer RQ3. The next section (10.4) discusses the assessment procedures adopted at the settings and also considers inferences for RQ4. This chapter also includes discussion of the strengths and the limitations of the study and also the scope for further research.

This discussion is consolidated from the data collected through two phases in this research. First phase was an online survey which represents 276 practitioners from England. The participation in this survey was well distributed as there was representation from all regions of England, all types of early years settings and also represents all the IDACI decile as explained in the section 6.2.1(First phase sample configuration). The second phase consisted of face to face interviews with 33 practitioners and 9 managers from 15 settings in Leeds and York. So, in total the views of 309 practitioners were represented in this discussion.

The nutrition knowledge recall test was conducted with 106 children aged between 3 to 5 years. The children were from the 15 settings from York and Leeds. Although the aim was to achieve at least one setting to represent various variables such as ethnic background, IDACI decile and urban or rural, due to practical constraints it was not possible. This had implications on representing the data analysis and generalising it as explained in section 6.2.2(Second phase sample configuration). So, the following discussion sections and the conclusions drawn from them were generalised where ever applicable and others represent only particular sample population.

10.1. Early year professionals' perspective on nutrition education

This section contains two sections. The first section discussing both practitioners' and managers' perspectives and the second section summarises the discussion into RQ1 answer.

Nearly half of the interviewed practitioners mentioned that they would share the responsibility to teach children about nutrition with parents. According to some of the practitioners, the responsibility to teach children about nutrition rests with the parents and 41% of the interviewed practitioners see their role as only supporting what children were taught at home. Interestingly 35% of the surveyed practitioners, 18% of interviewed practitioners and 33% of managers expressed the view that family or parents were a hindering factor for the practitioners to teach nutrition to children. The practitioners felt parents as hindering factor as there was no cooperation from parents in implementing healthy diet messages especially with lunch boxes and snack choices.. Many of the practitioners, mentioning parents as hindering factors might indicate that they were not agreeing with nutrition knowledge provided by parents to their children. So, this could be an indication that there was no co-operative relationship between

practitioners and parents in relation to nutrition education. S. N. Lang et al. (2016) and Goodall and Montgomery (2014) as suggested bilateral communication between practitioners and parents, could improve the relationship between practitioners and parents to work harmoniously in improving children's nutrition knowledge. And encouraging parents to participate in programmes such as HENRY and HAPPY would provide the required nutritional knowledge base. So, for children to gain nutrition knowledge at the settings a coordinated relationship between practitioners and parents might be essential.

A small minority of the interviewed practitioners considered teaching about nutrition to children was completely their responsibility. The research(D'Agostino, D'Andrea, Nix, et al., 2013; VanderBorght & Jaswal, 2009) suggests that practitioners have significant influence on the dietary choices of children. Children spending more time at the settings in the recent years (Department for Education (DfE), 2017b) could be the reason these practitioners took full responsibility to teach about nutrition. This increased time might also provide more opportunities to the practitioners to enhance children's nutrition knowledge.

The practitioners mentioning, they did not make any recorded observations might indicate EYFS ELG on healthy diet influence on the nutrition teaching practice of practitioners is minimum, but no direct evidence was found to validate it. Although 94% of the visited practitioners were aware of the fact that 'children understanding about healthy diet' is one of the key factors in the prime areas of EYFS guidelines (Department for Education (DfE), 2014b), no evidence found that the nutrition knowledge observations were included in the EYFS Prime area- Physical Development

observations. Nearly three quarters of the surveyed practitioners and a high number of interviewed practitioners mentioned they did not make any nutrition education related observations in children's learning journals and the remaining clarified the observations recorded were mostly when children tried new foods. As the Standards and Testing Agency (STA) (2016b) clearly states in its profile handbook that observations play a key role in assessment process; no evidence of recorded observations about children's nutrition knowledge or their progress, could indicate that personalised nutrition knowledge development plans for children might not be included in the assessments. Arguments can be made that although there was no written evidence the practitioners could have been educating based on their memories and experiences with each child, but the practicality of the argument should be questioned as retaining memory about each and every child over years is not feasible and practical. I agree with the less paperwork and more time to be spent in nurturing children but a word or two entry about nutrition knowledge in the learning journals could be just as useful as the observations about other areas in the overall development of the child.

A high level of confidence was expressed by a majority of the surveyed and half of the interviewed practitioners in dealing with the nutrition-related topic and wouldn't need any further resources or training in dealing with the topic. The other half of the interviewees expressed, they were not very confident in dealing with nutrition education. These numbers are in contrast to the surveyed where only less than one fifth were on lower levels of confidence. The interviews were conducted after testing children's knowledge the interviewed practitioners' point of view about nutrition education might have affected the level of confidence. The level of confidence of the practitioner was not statistically associated either with years of experience or level of

education, however, majority of the practitioners claimed they gained nutrition knowledge from life experience rather than education or in-job training. The scientific validity of their knowledge cannot be established as the knowledge could have developed through individual ideologies and as the nutrition knowledge was gained through life experience it might be unlikely to be consistent and similar across the early year settings in England. Ashkanani and Al-Sane (2012); (Sharma et al., 2013) like many other researchers suggested that the nutrition knowledge was not consistent across the practitioners and also the practitioners expressed difficulty in identifying reliable sources of information, which was also expressed by the interviewed practitioners.

The practitioners stated the reasons such as children with English as not first language, not sure what topics to be covered (age-specific topics) and cultural constraints. Fox et al. (2010) indicated that practitioners must develop age-specific nutrient knowledge to implement it without any hinderances. Training could be advantageous to improve the age specific knowledge and research has proven that training not only improves the knowledge of practitioners but also could make it cost effective (Bruder et al., 2009; Derscheid et al., 2010). Training could be the solution to achieve consistency across the setting and also improve the age-specific nutrition knowledge levels of the practitioners acquired through in-job training.

According to 85% of the surveyed practitioners, children were keen on learning about nutrition education, which could encourage the implementation of nutrition education. The majority of both surveyed and interviewees agree that the ideal age for children to start learning about nutrition education was below 5 years; this viewpoint was also

supported by the managers of visited settings. But a small fraction of interviewed practitioners (6%) and surveyed practitioners (1%) indicated that children should learn about nutrition when they are 6 years or above. There was a chance to clarify this aspect during the interviews and their reasons were that children might not be able to understand about nutrition topics such as five a day or about nutrients. However, T. R. Lee, Schvaneveldt, and Sorenson (1984b) in their research found evidence that preschool children (3-5years) were capable of learning basic nutrition concepts including nutrient functions and values, especially in classroom settings. So, lack of proper training or related resources as indicated by 18% of interviewed practitioners and 22% of managers in visited settings, could be the reason behind the practitioners not concentrating on the knowledge improvement aspect of nutrition education. The nutrition knowledge test conducted in this research indicated that children were able to decipher logical conclusions about their diet. So, proper training to the practitioners might aid them to realise that young children can understand and could be taught even complex topics such as nutrient absorption and metabolism in clear and simple language as indicated in Gripshover and Markman (2013) study.

According to the practitioners, nearly 100% of children have at least one meal at their setting but only three-quarters of the interviewees indicated mealtime as an opportunity to create a nutrition learning experience for the children. Meal times provides great opportunity for role modelling; research suggests that role modelling is one of the successful method in influencing children's food choices (Branen et al., 2002; Hendy, 2002; Tuuri et al., 2009), along with discussions to enhance children's knowledge. Although 98% of surveyed practitioners indicated that they talk about nutrition education, only half of them dealt with it on a day to day basis. A quarter of the surveyed

practitioners expressed that they dealt with the nutrition-related topics at regular intervals, weekly, fortnightly or monthly, whereas nearly half of the interviewees dealt with nutrition-related topics only occasionally that being yearly once or twice. The inconsistency in the frequency at which the topics were dealt with and the practitioners not utilising the opportunities to talk about nutrition should be further explored. Practitioners mentioning parents, children's likes and dislikes or allergies as constraints to teach about healthy diet could be as indicated in research studies (Trost et al., 2009) lack of proper age specific training and resources for nutrition-related topics. Proper training and resources could aid in overcoming these hindering factors as suggested in many research studies (Bruder et al., 2009; Unusan & Sanlier, 2007).

10.1.1. Conclusion

Hence, to answer the first research question RQ1. How do early year providers conceive their role in nutritional education?

Most of the practitioners indicated that to educate children (3-5years) about healthy diet was a shared responsibility between them and parents. However, most of them were aware that it is one of the key aspects in the Physical Development, a prime area of EYFS guidelines. Many of the practitioners mentioned they dealt with a nutrition-related topic on regular basis. There was evidence that they focused on making children try new foods, but no evidence was found that the practitioners created learning experiences for children about nutrition knowledge. They also mentioned that no observations were recorded to indicate that children had learning experiences to gain nutrition knowledge. As many of the practitioners indicated parents were the reason for not delivering nutrition education, developing a cooperative relationship could be the solution. Some managers and practitioners raised concerns about lack of appropriate training and resources. The lack of age-specific nutrition training for the practitioners

could be one of the reason for some practitioners feeling that they had constraints in delivering nutrition education. There were positive factors that could be utilised to promote nutrition education, such as practitioners recognising early years is the best age group to start nutrition education, practitioners' level of confidence, opportunities on day to day basis, and children's enthusiasm in learning about healthy diet. The practitioners' role in improving children's nutrition knowledge at the early years settings could be improved with proper nutrition realted training and resources.

10.2. Discussions about nutritional education in early years settings and their effects

The first section included in this section discusses about the discussion that takes place at settings in relation to nutrition education and also how they were applied in curricula. The second section concludes the discussion to answer the RQ2.

The practitioners indicated that there was not much discussion going in the staff members regarding nutrition education. If there were discussions, they were focused on making fussy eaters try new foods and these discussions were mainly by the key practitioner. Trying new foods was more emphasised at the settings and no evidence was found to support that knowledge is provided to develop children's understanding about particular food's role in their diet. As explained earlier although research suggest that accepting new foods might help children in habit formation but to retain the acceptance knowledge about the diet plays a vital role (Gripshover & Markman, 2013; Hong et al., 2010; Tuuri et al., 2009). In single person operated settings such as childminders the reason for not explaining about nutritional value was that children in these settings were generally below 3 years and might not be able to understand.

Most of the managers in their interviews indicated their settings were a part of Healthy Schools, which is a national programme to improve the overall status of schools under the guidelines of Department of Health (DH) and Department of Education and skills (2005). The Healthy Schools programme only focuses on providing healthy diet which was found at the settings and there was no evidence that knowledge about healthy diet is being transferred to children to make them understand about the healthy diet provided at the settings. This could be a missed opportunity, as research suggests healthy meal is one of the best opportunity to enhance children's nutrition knowledge (Vereecken et al., 2008). One of the main reasons for children not understanding the importance of the healthy diet which was provided at the settings was lack of involvement of the practitioners in planning the menus. In many settings, the practitioners were neither involved in planning children's meal menus nor were they informed about the developed menus nutritional importance. Most of the meals to be served were decided by the manager and the chef. Some settings did display their new menus for the parents and expressed that if the parents were keen to know, provided the required information, but the knowledge being shared with children was not found in any of the settings. The study by Shamasunder et al. (2014) suggested, institutional factor could be playing a vital role in delivering nutrition education which could also be the factor influencing in this context.

Although there were no regular discussions regarding nutrition education, as most of the settings implemented healthy weeks or special occasions focusing on food there must be some planning discussions involved to organise these events. These special events were mentioned by a quarter of the interviewed practitioners as the most memorable events with children. These practitioners mentioned about these events in

relation to nutrition education as they were surprised by either the level of skill children showed in preparation or the understanding of knowledge children shared with them on these occasions. Other than the assumption that there might be discussions to organise special events no evidence was found that practitioners plan and discuss learning experiences for children to gain knowledge about healthy diet on regular basis. Başkale et al.(2009); Derscheid et al.(2010) and Lumeng et al.(2008) suggested practitioners perceptions and attitudes could affect the implementation of nutrition education at the settings, so planning and communication between the staff could greatly influence the outcomes.

10.2.1. Conclusion

RQ2. How much discussion about nutritional education takes place among the staff at the settings? What are the effects of such discussions?

The managers at the settings were focusing on only providing healthy diet but not transferring the knowledge to children about it and also not actively engaging the practitioners with regards to children's healthy diet. The practitioners' focus was mostly on making children, who were fussy eaters, try new foods rather than on the nutrition knowledge enhancement. Children accepting the new food could be the perspective of managers' and practitioners' nutrition education, which would aid in developing a healthy behaviour but research suggests if children were offered the explanation the acceptance would last longer. This would aid in providing the cognitive ability for children to make the informed choice. Then if the explanation was provided to all children, as the focus was on only fussy eaters, the children who accept all foods wouldn't miss out on learning about the food provided. The practitioners agree that the enthusiasm and knowledge children express at special events surprised them, it could encourage in developing a positive hypothesis that proper planning about nutrition

learning experiences at regular intervals might improve the knowledge of children about healthy diet.

10.3. Teaching and learning techniques used to promote nutritional education

This section has two sections, the first discussing the learning experiences children have at the setting and the next section concludes to answer RQ3

The learning techniques used in the settings were more focused on children trying new foods and to certain extent understanding the source of foods. Gardening as a learning experience was not mentioned by nearly three-quarters of interviewed practitioners even when the gardening facility was available in most of the visited settings. Research across the world (Brouwer & Neelon, 2013; Cabalda et al., 2011; Heim et al., 2009; McAleese & Rankin, 2007; Morris et al., 2001; Triador et al., 2015) provides evidence that the acceptance of foods increases when children grow food themselves, as children trying new foods was considered as the main nutrition-related concept in many settings; not mentioning one of the most popular practical activity could be the case of either under-utilised resources or practitioners' inability to understand the importance. The practitioners mentioned other learning activities such as role-play, games, story-telling …, but again these techniques were mostly used to make children try new foods. Trying new foods may lead to healthy eating habits but there was no evidence on how much nutrition knowledge was provided to children to make an informed choice, as research suggests educating children about nutrition might improve their attitude towards food (D'Agostino, D'Andrea, Nix, et al., 2013; Hendricks et al., 1989; Niemeier et al., 2010). If the practitioners persuade children by providing nutrition knowledge it could aid developing a healthy behaviour and as research (K. J. Campbell & Hesketh, 2007; Chambers, 2017; Eppright et al., 1969) suggests healthy behaviour in early years

could affect life-long well-being. Developing the cognitive ability in children to make nutrition-related decisions could aid in improving the attitude towards food which might aid in retaining the healthy habits developed through trying foods. So only making children try new foods might not aid in long-term retention of the acceptance.

In the visited settings, 36% of the interviewed practitioners and 44% of the managers were keen on providing knowledge on sources of foods as one of the nutrition-related topics to children. 26% of the surveyed practitioners also mentioned this topic as one of the main topics to be included in nutrition education of children. Food preparation and procurement of ingredients were the learning activities used in the settings to improve children's knowledge about sources of foods. Children were taken to visit supermarkets in many of the settings, local markets and farm carts were also visited where they were available, whereas children from some of the rural settings (2/6) were taken to local farms to see where food is produced. Research also suggests that children acceptance of foods increase with hands on experience and if they learn more about them (Heim et al.,2009 & McAleese et al.,2007).

The healthy diet or balanced diet was mentioned by nearly 60% of the surveyed practitioners and half that percentage of the interviewees mentioned the related topic 'healthy me'. The 'Healthy me' topic was dealt with in 5 out of 15 visited settings as a once a year event, as a special week to focus on health-related topics in the settings, this being yearly event could be the reason fewer interviewees mentioned the topic. The term healthy diet is an umbrella term in relation to nutrition education which covers almost all the other topics, so all the learning techniques mentioned by practitioners could be assumed to be used in implementing it. There were many intervention studies

conducted to develop holistic education programmes which would help in children understanding various concepts of healthy diet using a combination of learning activities (Anderson et al., 2005; Auld et al.,1998; Başkale et al. (2009); Dunn et al., 2006; Gorelick et al.,1985; Knepple et al., 2012 & T. R. Lee et al.,1984b) , but none of these programmes were mentioned by any of the practitioners indicating there is a gap between the research and practice.

Portion size was one of the topics mentioned by a minor portion of the surveyed and interviewed practitioners. Role modelling was one of the techniques used to implement it, as the practitioners had their meal with children in some of the settings. Self-serving was also used in some settings to provide a chance for children to understand how much to serve and also motivate them to try new foods. The increased availability of high calorie foods increased the need to focus on portion size as also indicated by research (Fisher et al., 2008; Koletzko et al., 2010; Looney et al., 2011; McConahy et al., 2004; Small et al., 2013 & Weber et al., 1999). So, role modelling could be one of the techniques to educate children about portion size but due to inconsistency across the settings it could not be established that knowledge about portion size was provided at the settings.

Children gaining knowledge about fruits and vegetables was mentioned by a fifth of the managers and by a similar fraction of surveyed and interviewed practitioners. Role-play, storybooks (The Very Hungry Caterpillar), coloured days, and discussions were the learning techniques used in the settings to teach children about fruits and vegetables. Role-play was one of the main learning technique mentioned in interviews, where they observed children exploring real fruits and vegetables for their texture and

taste. The Very Hungry Caterpillar was the only storybook mentioned by the practitioners in relation to healthy diet education, which might suggest lack of readily available resources. Coloured days were the concepts used in the early year settings to encourage children to identify different fruits and vegetables associated with that colour, for example, a red day can be related to strawberries and tomatoes. Food discussions with children were mentioned by a few practitioners to converse about: why vegetables are good? Or if chocolate is good or fruit? Although practitioners associated all these techniques to nutrition education, they were not consistent across the settings and also steps taken to further enhance the learning were not mentioned by any of the practitioners.

Surveyed practitioners (8%) mentioned ‘five a day’ to teach children about fruits and vegetables, many of the interviewees felt that the concept was above the understanding of children at this age. Some of the interviewed practitioners also mentioned that they were confused themselves due to different concepts, such as rainbow diet, being introduced every few years and were not using any of them. Sizer and Whitney (2008, p. 434) in their book ‘Nutrition: Concepts and Controversies’ stated that research suggests five a day is suitable for children under the age of six years and as to what include in the diet the concept of a rainbow of fruits and vegetables might be useful. But as practitioners were not trained with the relevant information, they were not utilising the research-based ideas to full potential. Many of the practitioners mentioned they also struggled in identifying the correct information.

There were other healthy diet-related topics such as hygiene, dental health, nutrients and exercise mentioned by surveyed practitioners and also by a small percentage of

interviewed practitioners, but little evidence was found to confirm that the topics were addressed at the settings or what techniques were being used to do so.

Nutrition knowledge testing was conducted at the visited settings with an aim to know children's source of nutrition knowledge. According to children, their parents were the primary source of their knowledge and a minor set of children declared as self-taught. Only 6% mentioned that they learnt about nutrition at the settings, this response did not increase even after leading question, "did anyone here in the school tell you about what food is good for you?". This might not be a surprise as a majority of the practitioners felt providing nutrition knowledge to children was parents' responsibility.

The nutrition knowledge test also provided an insight into what children's thoughts were about various nutrition-related concepts. Majority of the children were able to recognise what food is healthy and what is not healthy, and more than half of the children made a choice of different foods which could be identified as a balanced meal. Nearly 90% of the children were certain water is the best drink to have when thirsty, but only a third of them were able to conceptualise the minimum number of glasses of water to be taken in a day. Brushing twice was the oral care tip given by 68% of the children. Many of them were able to say how many meals should be taken in a day but when it came to how much we can have at a time only half of them had chosen small portions. Although 68% of the children said only one treat a day is good for health, only 39% of them were able to identify the similarities between different types of treats such as ice-cream and cake or cake and lollipop. The concept of 5-a-day was where most of the children lacked the knowledge, only 8% of them mentioned it means eating fruits and vegetables.

This data provided the evidence that children can understand the nutritional concepts and some of them were able to give the logic behind their thoughts, as supported by research that children have the cognitive ability to understand various nutrition concepts (Anliker et al. (1990). As indicated in the research studies, in this study also children were not able to conceptualize whole day and also struggled in differentiating low contrast foods (Nicholson et al., 2017). Correct guidance could improve their knowledge and understanding of the healthy diet. This nutrition knowledge test was developed based on surveyed practitioners' online questionnaire answers. So, though a small number of the interviewed practitioners expressed a view that the knowledge test used was at a higher level to test 3-5 years children, the knowledge shown by children was proof itself that this age group children understand concepts of a healthy diet which were mentioned by the majority of the surveyed practitioners.

10.3.1. Conclusion

RQ3 What teaching and learning techniques are used to promote nutritional education? How effective are they?

Role-play, ingredient procurement experiences and food preparation exercises helped children to explore fruits and vegetables and also provided knowledge about their source. 'The Very Hungry Caterpillar' was the only storybook mentioned by most of the practitioners which could indicate shortage of appropriate alternatives. Although there were few glimpses of some of the topics being addressed at the settings using various learning techniques, there was no evidence to establish the effectiveness of these learning techniques on children's nutrition knowledge. The word effectiveness in this research meant signs of nurturing children's ability in development of nutrition knowledge. The evidence developed through children's nutrition knowledge test was

limited to establishing children's cognitive ability in understanding nutrition but not that the knowledge was acquired from the practitioners. So, children have the ability to develop a cognitive understanding of nutrition but evidence of it being nurtured at the early years settings could not be established through this research.

10.4. Assessment of nutritional education in early years settings

This section also has two sections; the first focusing on the nutritional knowledge assessment procedures followed at the settings and the next one focused on concluding the discussion to answer RQ4.

The general assessment in the early years settings does happen mostly through observations which were recorded in the children's learning journals. The effort to look into children's learning journals was hindered due to various factors and was able to access only two journals as explained in sample demographics (section 6.2.2). However, information about observations was collected through online questionnaire and interviews to check if the observational assessment procedure was followed for nutritional knowledge assessment. Although 45% of surveyed practitioners and 64% of the interviewed practitioners observed nutrition-related reflections in children; only half of these practitioners were positive that they had written observations regarding children's nutrition knowledge or learning experiences. Most of the visited practitioners were clear the few recorded observations were limited only to when fussy children tried new foods or as a list of food preferences as a part of new child's profile. The higher percentage of interviewed practitioners mentioning about children's nutrition knowledge could be due to the question during the interviews which asked practitioners about their most memorable incident in relation to nutrition education. However, though some of

the practitioners mentioned they did record the observations no evidence could be accessed that these observations were consistent and were used for planning and further development of children's nutrition knowledge.

Though there was no evidence of the written observations, based on practitioners responses, many practitioners mentioned about oral reporting of the nutrition-related observations such as an end of the day feedback to parents or discussion among staff members. However, these observations were limited to the food choices made or trying new foods.

10.4.1. Conclusion

RQ4 How do providers use assessment to inform their approaches to nutrition education?

There was only ephemeral evidence found that assessment was used by practitioners to inform their approaches to nutrition education. The nutrition education provided at the settings was limited to trying new foods as discussed in earlier sections and the brief evidence supports the same. Also, as children revealed they gained most of their nutrition knowledge from parents; this is congruent with previously discussed evidence that practitioners considered teaching children about nutrition was parents' responsibility.

10.5. Sample demographics influence summary

The sample demographics allowed to recognise data variables which could be utilised for in-depth analysis by comparing and contrasting the associated information. This

section is summarising the influence of various sample characteristics on nutrition education which was discussed in the analysis chapters.

The first phase sample varied in the type of settings, regions of England and also IDACI decile. The association of these variables with the frequency of nutrition education and recording the observations was individually tested; however, the statistical tests of association(chi-square) revealed no association between these factors.

In the second phase, although the sample aimed was purposive, comparison of only one variable urban or rural was possible due to the final sample size. This variable influence was found in the implementation of the topic ‘food preparation and sources of food’. Children from rural area settings visited farm carts and local market whereas their counterparts from urban settings visited mostly supermarkets to procure ingredients for the food preparation activities. Only 2 out of the 6 rural settings mentioned that they arranged farm visits for children to understand about ‘where food comes from?’. There was no mention of farms by other rural settings but some of the practitioners working in urban settings mentioned that they used to arrange local visits to butchers and farmyards but stopped due to urbanisation. There was no influence on the level of children’s knowledge between the two areas.

Some variations were found between the responses of surveyed and interviewed practitioners. There was a major difference in percentages between these two groups in expressing their confidence levels. A higher percentage of interviewed practitioners expressed they needed support in providing nutrition education especially in developing teaching resources and child-level activities. The reasons could be due to the topics

included in nutrition test, conducted with children as a part of the research, as the focus with nutrition education in these settings mostly was to make children try new foods rather than provide knowledge about foods. The responses were quite opposite when asked about hindering factors, more of the surveyed mentioned that they had hindering factors in delivering nutrition education. Not many interviewees mentioning hindering factors could be a result of social desirability bias (Bryman, 2016) as family or parents was the hindering factor mentioned by the majority of the surveyed practitioners. The other topic where there was a dissimilarity between these two groups of practitioners was on the topics to be included in children's nutrition education. The interviewed practitioners concentrated on making fussy eaters try new foods through food preparation activities. The surveyed practitioners mentioned that teaching about balanced diet was important, only a few of the interviewed practitioners mentioned it. 'Fruits and vegetables' was one topic both of them agreed on equal propositions but there was very little or no mention from interviewees about the other surveyed practitioners suggested topics such as nutrients, exercise, dental care…Although there was a mention about mealtimes, as an opportunity to teach children by both the practitioners, no evidence was found to associate it with nutrition knowledge development in children.

The other sample relationship analysed was between managers and practitioners. Managers were interviewed at the visited setting to understand their influence in nutrition education. Although all of the managers mentioned that nutrition education was very important in their settings, further data analysis confirmed that it was restricted to providing healthy diet but not in providing the knowledge about the diet. Some of the interviewees and a few surveyed practitioners mentioned that management did not

provide the support to deliver nutrition education. Mealtimes were a missed opportunity in many of the settings due to lack of communication about provided healthy meals between the managerial staff and practitioners. Managers mentioned healthy diet, hygiene, dental health, fruit and vegetables, and sugar were some of the important topics to include in children's nutrition education which were similar to the topics suggested by surveyed practitioners but there was no evidence of either discussion or support within the settings to promote these topics. All of the managers did not involve in any of the planning of the nutrition education. More than half of the managers were also keen on making children try new foods similar to the nutrition education objective of interviewed practitioners.

10.5.1. Conclusion

The surveyed data indicated that there was no influence of geographical location, area deprivation and type of settings on the frequency of the nutrition education or recording observations. Frequency indicates if the nutrition related topic was dealt regularly or not which in turn might indicate how much priority was being given to the topic by practitioners. There was a slight variation in the places children visit to learn about sources of food in urban and rural areas. The practitioners' prediction of nutrition topics was different from that implemented at the settings. The settings focused on making fussy eaters accept more variety of food items but there was no consistency in the learning experiences at the settings for overall children's nutrition knowledge development. There was also no communication between managerial staff and the practitioners with regards to healthy diet education for children.

10.6. Strengths of the study

“Research is only one of many inputs into the policy process. Successful policy is when evidence, policy and delivery all come together” (Bartholomew, 2015) This research provides an indication of the nutritional education status in England which could serve as an evidence for the implementation of one of the key aspect of EYFS framework understanding about a healthy diet. This research could also provide evidence base for the understanding the current ways as indicated in the NICE, ‘Practical steps to improving the quality of care and services’(2015).

The research was conducted in two phases using mixed research methods and also social media which aid in reaching wider well-distributed sample population, so, it could be generalised for the settings across England as well as gather a concentrated picture of the two specific areas. Mixed methods utilisation not only helped in the development of research tools but also in developing clarified conclusions. The biased representation factor was eliminated in this study as the sample consisted of all the four types of early years settings. The second phase, that was developed based on the first phase, aided in utilising information provided by the practitioners for in-depth analysis of the state of nutrition education. This is a strength of the study as the information was not alien expectations but those suggested by fellow practitioners.

Social media is used in this research to directly approach surveyed practitioners after trying the conventional methods such as emails to the institutes. The use of social media to approach the early years practitioners in this research could also provide the methodological insights for future reference. The use of online survey through social media has provided an opportunity to acquire a well distributed sample which

represented all the regions of England, all the IDACI decile and also all the types of settings. Although this research was not set out to provide the methodological insights the details on the challenges faced during the study using social media could help future researchers using social media as sample acquiring platform.

The study analysed the interconnection between all the three crucial links at the early years settings that could influence nutrition education implementation- managerial staff, practitioners and children. This provided an overall perspective than a biased view. The sample size of children also provided the scope to generalise the views to a wider representative population.

The timing of the research was also crucial, as there were proposed changes in the assessment procedures for early years settings from September 2016 and a new EYFS framework was introduced in March 2017.So, this research might provide the evidence for nutrition education assessment before the new assessment procedures and could be used in future comparative research.

10.7. Limitations of the study

The second phase was also confined to only two areas due to various practical constraints. The sample size restricted the exploration of the purposive variables influence on nutrition education. As the research was time bound, all the features of grounded theory such as theoretical saturation and theoretical sampling were not included to the full extent. Mixed methods made triangulation possible as comparison of most of the responses from surveyed practitioners, interviewed practitioners and managers was possible, but not all the responses could be triangulated due to variation in the questions of online questionnaire and interviews. Triangulation assures the

validity of the research as responses were collected in different ways and types for the same topic.

Trying new foods was one of the key learning outcomes mentioned by many interviewed practitioners, the nutrition knowledge children gained during this process couldn't be established through this study. There was a difference in the learning outcome expectations between the researcher and the practitioners regarding nutrition education. The practitioner's emphasis on children 'trying new foods' could be indicating that they were focusing on the behavioural outcome, but the research was focusing on the knowledge gain, this could have limited the scope of the study.

Questions asked in the nutrition test varied from group to group as the child interactive session was more conversational than a question and answer session. This could be a limitation as there would be slight variations in the interpretations of the questions. The questions although focussed on knowing the level of children's nutrition knowledge there were situations where focus was on their understanding. For example, when explanation was asked on the heathy diet choices or deciding on the portion size. Professor Ip (2003) indicated in his paper, knowledge is acquiring information whereas understanding is comprehending the concept based on the information. However, in this research the difference between the two was not emphasised and the two terms were used as terms with similar meaning.

The questions and research tools used in the knowledge test could be limitations to the study, as explained in the section (9.2). The use of imaginary plates in the questions relating to balanced diet and portion size could create an ambiguity; similarly use of

picture cards was a limitation, as the real size of the food items was based on each child's imagination. The generalisation of the questions could also not be applicable in all the visited settings as the settings could have their unique practices, use of water-bottles instead of glasses and also variation in the size of glasses etc. The general practices were observed and included in the questionnaire, however the generalisation of the used tools could be a limitation. Due to the data constraints (did not collect the age of children), the study also did not analyse the relation between age and nutrition knowledge ability, however, this could be one for the future research.

10.8. Future research

A comparative study of different regions of England might help in understanding the wider state of nutrition education in early years settings. Though this study was based in England, a study on understanding the policies of other countries of Great Britain in improving early years children nutrition knowledge could provide an insight into the implications of their policies and long-term implications on the well-being of children in the UK. An international study might provide an opportunity to compare the similarities and differences of the methods and their impact. As indicated in strengths of research, this research could provide an insight into the current ways of services and be basis for further research to make plans or policy measures for improvement as indicated in NICE practical steps (2015).

There is also scope for research focusing on the factors effecting the practitioners' perceptive to provide nutrition knowledge, although an insight on some of the factors was discovered in this study, the study focussing only on their perspectives would help in understanding the measures needed. As the research concludes that the practitioners need age specific training to provide nutrition education, research could

be done in resource development and also in developing nutritional education training facilities for the practitioners. Research is also needed for understanding if policy interferences are needed to improve the status of nutrition education and also explore the coordination between the various departments as the research review shows there were guidelines and resources about nutrition education but many of the practitioners were not aware of them. A research study could be done focusing on the EYFS-ELG influence and measures to be taken, although this research explored the influence to a certain extent the major focus was on the overall nutrition education status.

Research in further understanding each topic included in the children's nutrition knowledge test; as they have their own distinct importance; the learning activities for each topic could be further investigated for example ‘what methods would be effective in improving children's knowledge about ‘five a day' or children’s ability to understand the ingredients of foods like sugar in treats. A longitudinal study on the age variation in the ability to understand nutrition knowledge could also help in developing age appropriate materials for effective nutrition education.

Studies could also focus on methods to bridge the gap between the research and practice, as there were many intervention studies which explored effective learning techniques none of them were found in the field. This research could also aid for future studies by providing the insight to current scenario and be basis for comparative studies.

Summarised Conclusion

EYFS did not influence nutrition education in the early years settings. Although practitioners agree on the importance of providing nutrition education, no practical evidence of implementation was found to improve children's nutrition knowledge. The institutes' policies and managers' attitudes focused more on making children eat healthy foods but not on providing the knowledge about it. The learning outcome of nutrition education in the early years settings was not aimed at making children understand about the healthy diet. One of the best opportunities, mealtimes was not utilised by many of the practitioners to improve children's nutrition knowledge. Practitioners limited nutrition education to try new foods, but children showed that they had the cognitive ability to understand nutritional concepts. The settings were depending on very limited resources and were not exploring the nutrition education resources available. The practice in early years settings ascertains the need for age specialised nutrition education training for the practitioners.

Nutrition education was found important in policy and in the thoughts of the early years professionals but there was limited evidence on the extent of nutrition knowledge children were gaining at the settings. This research concludes that early years professionals ascertain children’s nutrition knowledge is important but need more support to nurture nutritional knowledge development and understanding in children.

Appendix.1. Early years Practitioner's Questionnaire

Participant Consent Form:

What will be involved in participation?
I understand that:
- The purpose of the study is to assess nutritional education in early years settings.
- The study is being carried out by Aparna Gummadi, a PhD student in the Department of Education at the University of York.
- The study involves completing a 10 minute questionnaire.
- If I volunteer, I may be invited to participate in a follow-up in-depth study.
- My responses in the survey will not have an impact on my work and only anonymized data will be communicated in the research.

How will my data be handled?
I understand that:
- My participation is voluntary. I understand my identity will be anonymous from the time of collection unless I volunteer for further research study. Therefore it will not be possible to withdraw my data once provided.
- If I volunteer for further study, the data and information I provide will be anonymized by the researcher as soon as possible after collection. Only the researcher will have access to the data and information before it is anonymized.
- The anonymized data will be archived and may be used for other academic and research purposes by other researchers inside and outside the University.
- The anonymized data may be disseminated through seminars, conference presentations, journal articles and other scholarly publications.
- The data will only be used for academic and research purposes.
- If I volunteer for further research study, I may withdraw myself and my data before 31/7/2015 by informing the researcher Aparna Gummadi (ag1263@york.ac.uk) without any penalty being imposed on me.
- Tutors in the Department of Education will only have access to the anonymized data.
- Only the researcher will have access to any personal data that I may provide, to allow the researcher to contact me to participate in the further study; that information will be destroyed once the further study data has been collected.

What should I do if I have questions or concerns?
I understand that:
- This project has been reviewed by and received ethics clearance through the ethics committee in the Department of Education at the University of York.
- If I have any questions about this research, I should in the first instance contact the researcher, Aparna Gummadi (ag1263@york.ac.uk) or her supervisor, Dr Jeremy Airey (jeremy.airey@york.ac.uk)
- If I have any concerns about the conduct of this research, I may contact the Chair of the Education Ethics Committee, Dr Emma Marsden (emma.marsden@york.ac.uk).

*Required

1. **I read the above consent form** *
   Mark only one oval.
   - ◯ I agree and give my consent *Skip to question 2.*
   - ◯ I disagree *Stop filling out this form.*

PLEASE RESPOND TO ALL THE QUESTIONS.

In this questionnaire 'children' means young children attending the setting.

2. **What type of early years setting is your institute?** *
Mark only one oval.

- ◯ Childminder
- ◯ Preschool or nursery (term time only)
- ◯ Day care or nursery
- ◯ Nursery and reception
- ◯ Other: _____

3. **Can you please provide first half of the post code of the institute?** *
Its used only for data analysis purpose only .

_____

4. **Do the children have food at the setting ?** *
Mark only one oval.

- ◯ Yes *Skip to question 5.*
- ◯ No *Skip to question 7.*

5. **If children have food at the setting , can you please mark all that apply on daily basis**
Mark only one oval per row.

	Provided by setting
Fruit	◯
Milk	◯
Biscuits	◯
Cakes	◯
Lunch	◯
Evening meal	◯

6. **If children have food at the setting , can you please mark all that apply on daily basis**
Mark only one oval per row.

	Bring from home
Fruit	◯
Milk	◯
Biscuits	◯
Cakes	◯
Lunch	◯
Evening meal	◯

7. **At what age do you think children are ready to start learning about healthy diet?**
Mark only one oval.

1	2	3	4	5	6	
◯	◯	◯	◯	◯	◯	6years and above

8. **What are the five most important topics you think should be covered ,when children are learning about healthy diet or good nutrition practices?**

_____

_____

_____

_____

_____

9. **Are the diet related observations recorded?**
As a part of your regular observations to relate to the prime areas of EYFS framework.
Mark only one oval.

- ◯ yes
- ◯ no

10. **Do you talk to the children about importance of healthy diet and what a healthy diet is?** *
Mark only one oval.

- ◯ Yes *Skip to question 11.*
- ◯ No *Skip to question 17.*

11. **If Yes how frequently do you deal with healthy diet related topic?**
Mark only one oval.

- ◯ day to day basis
- ◯ weekly
- ◯ fortnightly
- ◯ monthly
- ◯ occasionally

12. **How enthusiastic are children on an average to learn about nutrition?**
Mark only one oval.

	0	1	2	3	4	5	
Not interested	◯	◯	◯	◯	◯	◯	Very keen

13. **Did you find any significant changes in their food choices after learning about healthy diet?** *
Mark only one oval.

- ◯ Yes *Skip to question 14.*
- ◯ No *Skip to question 16.*

14. **If you know there are changes in their food choices , how did you know about it?**
Tick all that apply.

- [ ] Personal observation
- [ ] Parents feed back
- [ ] Colleagues observation
- [ ] Other: _____

15. **Are these diet related observations recorded?** *
Mark only one oval.

- ◯ Yes *Skip to question 18.*
- ◯ No *Skip to question 18.*
- ◯ Only temporary feed back like end of the day oral feedback *Skip to question 18.*

16. **If no changes are observed, What could be the reasons?**

_____

Skip to question 18.

17. **If you are not talking to children about healthy diet related topics.What are the reasons for not talking about it?**

_____

18. **How confident are you to plan and implement a healthy diet related learning with children?**
Mark only one oval.

	0	1	2	3	4	5	
Not at all confident	◯	◯	◯	◯	◯	◯	Very confident

19. **How did you acquire your knowledge about healthy diet?**
Tick all that apply.

- [ ] Secondary school (Up to 16) education
- [ ] Higher education
- [ ] Experience
- [ ] Specific training
- [ ] In job training
- [ ] Other: _____

20. **If you want to evaluate the healthy diet knowledge in children, what questions would you ask the children?**
Any two questions you think are appropriate or you feel children should have knowledge about.

21. **Please, tell me about any constraints or difficulties faced while dealing with diet related topics.**

22. **How many years of experience do you have as early years practitioner?**
Mark only one oval.

	0	1	2	3	4	5	
less than a year	◯	◯	◯	◯	◯	◯	5 years and more

23. **What is the highest educational qualification you hold?**

24. **Thank you for participating in this online survey.Would you be willing to participate in a more in-depth study as part of this research?** *
Mark only one oval.

- ◯ 10 minute face to face interview
- ◯ 10 minute telephone interview
- ◯ No *Stop filling out this form.*

25. **Thank you for volunteering for the in-depth study. Can you please give your Postal address of the institute so that I can contact you.** *

26. **Please provide your email ID** *

27. **Please confirm your email ID** *

Appendix.2. 10-minute Interview template for the management.

Name of participant _____

Name of Institute_____

1. What's the institutes' policy about nutrition education?
2. What topics must be emphasized in nutrition education?
3. What do you think is the ideal age to start nutrition education?
4. What's the managements' role in planning learning experiences in nutrition education?
5. Do you arrange any training in nutrition?
6. Do you know healthy diet education is a part of EYFS?
7. Do request the staff to make regular observations in relation to healthy diet?
8. How do you think will the future of nutrition education would be if there was no EYFS?
9. What are the hindering factors in nutrition education?
10. Any further comments.

Participant consent: I agree the above written notes are a copy of face-to-face interview and I have read the written notes and have no concerns of using the notes by the researcher in her research anonymously.

Signature of participant: _____ Date: _____

Appendix.3. 10-minute Interview template for the early years practitioners.

Name of participant _____ Name of Institute_____

1. Who is responsible to teach children about nutrition?
2. Is nutrition education a part of the curriculum?
3. What's the institutes' policy about nutrition education?
4. What do you think is the ideal age to start nutrition education?
5. How learning experiences are planned and what types of teaching techniques are used in nutrition education?
6. What opportunities do you find to promote nutrition education in day-to-day activities?
7. What was the most memorable incident related to nutrition education?
8. Did you have any training in nutrition?
9. Do you know healthy diet education is a part of EYFS?
10. Do you make regular observations in relation to healthy diet?
11. How do you think will the future of nutrition education would be if there was no EYFS?
12. What are the hindering factors in nutrition education?
13. What kind of support do you need to make nutrition education effective?
14. Any further comments.

Participant consent: I agree the above written notes are a copy of face-to-face interview and I have read the written notes and have no concerns of using the notes by the researcher in her research anonymously.

Signature of participant: _____ Date:

Appendix.4. Field notes for children nutrition knowledge recall test.

Nutrition Knowledge	No response			
Classify		Sorted based on colour or size or liking or taste	Sorted into healthy and unhealthy or good for body not good for body	Sorted into healthy and unhealthy and could explain why it's good or not good for our body.
Five a day		Food	Fruit and vegetable	Fruit and vegetable and importance of 5 a day
Number of meals or snacks we can have per day		On demand	3 meals	Have small meals at regular intervals
Balanced diet		Fill the plate without any particular order of choice in relation to food groups	Select foods from each basic food group	Select foods from each basic food group and able to explain why it's a balanced diet.
How much can you have for each meal		Fill the plate	Small portion to medium portions	Small portions from all food groups

How can we keep our teeth healthy?		Brush daily	Brush twice daily	Brush twice daily. Less sweets and fizzy drinks.
Chocolates/treats quantity per day		Treats more than 2 a day.	Treats one or two a day.	Treats not every day only occasionally
What do you think Sugar or Chocolates are bad?		Each treat is different	All treats are similar.	Treats are similar and able to explain why they think they are similar
What drink is good for our health?		Fizzy drinks	Milk, juice and water	Milk, juice and water. Can explain why they are good.
How many glasses of water should we have every day to be healthy?		water less than 4 glasses	water 4- 6 glasses	water more than 6 glasses
Source of knowledge	1. Self	2. Friend/Peer	3.Parents	4.Grandparents
5.Siblings	6.Media	7.Early year practitioner	8.Other	9. No response
Name of child:		Name of institute:	Date:	Name of observer:

Appendix.5. List of Picture cards used to children's sorting game.

Biscuits - Biscuits 2, Crackers 1.

Bread - Bread slices 1, French Stick 1.

Cakes - Cake piece 1, Cake 1, Cupcake 1

Dairy - Butter 1, Cheese 1, Cream1, Milk 1

Egg- Egg 1, Fried eggs 1, Scrambled 1.

Condiments - Sugar 1

Vegetables -Asparagus 1Beans 1, Butter beans 1, Broccoli 1, Cabbage 1, Capsicum 1, Carrots 1, Cauliflower 1, Courgette 1, Mushrooms 1, Onions 1, Peas 1, Pumpkin 1.

Drinks - Cappuccino 1, Coffee 1, Water 1, Hot choc 1, Juice 3, Lemonade 1, Orange juice 1, Tea 1

Fruit – Apple 1, Banana 1, Cherries 1, Coconut 1, Avocado 1, Grapefruit 1, Grapes 1, Mango 1, Nectarine 1, Orange 1, Lemons 1, Passion fruit 1, Peach 1, Pear 1, Pineapple 1, Raspberries 1.

Meat - Bacon 1, Chicken 1, Ham slices1, Lamb 1, fish1.

Meals/Snacks - waffles 1, soup 1, chips 1, Burgers 1, crisps 1, pizza 2, hot dog 1, popcorn 1, pasta 1, sausage roll 1, sandwich 1, spring rolls 1, rice1.

Puddings/Desserts - Puddings 1, Cheesecake 1, Jelly 1, Pastry 1, Jam tart 1, Pancakes 1, Ice cream/cones 1, Lollipops 1, Chocolate 2

Appendix.6. Head of the institute consent letter

THE UNIVERSITY of York

DEPARTMENT OF EDUCATION
Heslington, York, YO10 5DD

Direct Line: (01904) 323455
Fax: (01904) 323459
Email: educ525@york.ac.uk
Web: www.york.ac.uk/educ

Head of Institute consent letter

Dear Head teacher,

Thank you for agreeing to support a study about nutrition education involving your institute. Please read, sign, and return, the enclosed consent form so that I can proceed further with my study.

As described in my email, my research requires me to conduct 10-minute face to face individual interviews with all the early years practitioners working with children aged 3-5 years; a similar interview with the manager; and 10-minute games with up to five children (3-5years old) from each class. Participating children will be randomly selected with your staff's help. I will then look through the participating children's learning journals.

I would appreciate it if you could sign the enclosed form. Many thanks in advance for your consideration of this project. Please let me know if you require further information. Thank you again for your support.

Yours sincerely,

G.Aparna

(Researcher)
(Aparna Gummadi,
PhD student, Department of Education,
University of York.)

Consent forms

Appendix.7. Head of the institute consent form

THE UNIVERSITY of York

DEPARTMENT OF EDUCATION
Heslington, York, YO10 5DD

Direct Line: (01904) 323455
Fax: (01904) 323459
Email: educ525@york.ac.uk
Web: www.york.ac.uk/educ

Head of institute consent form

What will be involved in participation?

I understand that my institute will be:

- Assisting the researcher to identify a group of children for the study, allowing practitioners and a relevant manager to take part in this study.
- Assisting the researcher by sending a consent letter to the parents or guardians of the young people selected in order to obtain parental consent for their children to take part in this study.
- Allowing the researcher, the use of a suitable location in which to conduct the interviews and interact with children.
- Allowing the researcher to conduct research during setting hours. These interviews should take about 10 minutes with each participant.

The researcher has an enhanced Disclosure and Barring Service (DBS) check and wherever possible one of the staff members will be present when the researcher is working with the children.

I understand that my setting's participation in this study is entirely voluntary. I understand that the participants will also be free to withdraw themselves from this study at any time and without giving a reason.

How will my data be handled?

I understand that:

- My institute's participation is voluntary, and we may withdraw ourselves or our data or both ourselves and our data before [30/6/2016] by informing the researcher [Aparna Gummadi (ag1263@york.ac.uk)] without any penalty being imposed on me.
- Only the researcher administering the interviews will have access to the data and information collected in this study before it is anonymized. All personal data will be stored securely and destroyed once anonymized.
- The researcher will anonymize the data and information collected during this study as soon as possible after collection.
- The identity of all participants will be treated confidentially by the researcher, who will not disclose any personal information unless in the unlikely event of being morally or legally obliged to alert relevant external authorities.
- All information appearing in the final report will be anonymous.
- All participants will have the option of withdrawing their data from the study, up until their transcript has been anonymised.
- Tutors in the University of York Department of Education will only have access to the anonymized data.

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- The anonymised data will be archived and may be used for other academic and research purposes by other researchers inside and outside the University.
- The anonymised data may be disseminated through seminars, conference presentations, journal articles and other scholarly publications.
- The data will only be used for academic and research purposes.

What should I do if I have questions or concerns?

I understand that:

- This project has been reviewed by and received ethics clearance through the ethics committee in the Department of Education at the University of York.
- If I have any questions about this research, I should in the first instance contact the researcher, Aparna Gummadi (ag1263@york.ac.uk) or her supervisor, Dr Jeremy Airey (jeremy.airey@york.ac.uk)
- If I have any concerns about the conduct of this research, I may contact the Chair of the Education Ethics Committee, education-research-administrator@york.ac.uk

I have read and understood the accompanying letter and give permission to conduct the study in the institute.

Signature of Head of institute: .....

Date: .....

Print name: .....

Name of the institute: .....

Post code.....

Consent forms

Appendix.8. Participant consent Form

DEPARTMENT OF EDUCATION

THE UNIVERSITY of York

Heslington, York, YO10 5DD

Direct Line: (01904) 323455
Fax: (01904) 323459
Email: educ525@york.ac.uk
Web: www.york.ac.uk/educ

Participant Consent Form: Interviews for practitioners.

What will be involved in participation?

I understand that:

- The purpose of the proposed study is to assess nutritional education in early years settings. This is part of a PhD research project at the University of York.
- The study involves participating in a 10-minute face-to-face interview using voice recorder and with written notes being taken by the researcher. I will be given a chance to approve the written notes after finishing the interview.
- My responses in the interview will not have an impact on my work and only anonymized data will be communicated in the research.

How will my data be handled?

I understand that:

- My participation is voluntary, and I may withdraw myself or my data or both myself and my data before [30/6/2016] by informing the researcher [Aparna Gummadi (ag1263@york.ac.uk)] without any penalty being imposed on me.
- Only the researcher administering the interviews will have access to the data and information collected in this study before it is anonymized. All personal data will be destroyed once anonymized.
- The researcher will anonymize the data and information collected during this study as soon as possible after collection. The identity of all participants will be treated confidentially by the researcher, who will not disclose any personal information unless in the unlikely event of being morally or legally obliged to alert relevant external authorities.
- Tutors in the University of York Department of Education will only have access to the anonymized data.
- The anonymized data will be archived and may be used for other academic and research purposes by other researchers inside and outside the University.
- The anonymized data may be disseminated through seminars, conference presentations, journal articles and other scholarly publications.
- The data will only be used for academic and research purposes.

What should I do if I have questions or concerns?

I understand that:

- This project has been reviewed by and received ethics clearance through the ethics committee in the Department of Education at the University of York.
- If I have any questions about this research, I should in the first instance contact the researcher, Aparna Gummadi (ag1263@york.ac.uk) or her supervisor, Dr Jeremy Airey (jeremy.airey@york.ac.uk)
- If I have any concerns about the conduct of this research, I may contact the Chair of the Education Ethics Committee, on education-research-administrator@york.ac.uk.

I have read and understood the information above and I agree to participate in the study.

Name of participant _____ Date _____ Signature_____

Name of Institute_____

Consent forms

Appendix.9. Parental consent letter

THE UNIVERSITY of York

DEPARTMENT OF EDUCATION
Heslington, York, YO10 5DD

Direct Line: (01904) 323455
Fax: (01904) 323459
Email: educ525@york.ac.uk
Web: www.york.ac.uk/educ

Parental consent letter

Dear Parent,

I am a PhD student in the Department of Education, University of York. As part of my research I am carrying out a study looking at nutrition education in early years settings. I feel that it is important to talk to young people about their knowledge about healthy food, which may affect their life long food habits. I hope that this information will help in improving nutrition education in the future.

I am writing to ask if you would be willing to confirm with your child (3-5 years old) if they would like to take part in my research and then to give your permission for your child to do so.

Taking part will involve playing some indoor games and answering a few questions that I will ask to find out what the children know and think about nutrition and health. The participation would take place at (insert school name) during normal school hours and will take between 10 - 20 minutes of your child's time. I will also go through their Journals to see for any diet-related recorded observations. Your child's participation in this research will be treated confidentially and all information will be kept anonymously.

The University of York's Department of Education ethics committee has approved this research. Dr Jeremy Airey, University of York, will supervise this project.

Many thanks in advance for your consideration of this project. I would appreciate it if you could complete the attached permission slip and return it to the setting.

If you have any comments or questions or need more information about this research please feel free to contact me at ag1263@york.ac.uk.

Yours sincerely,

G.Aparna

(Researcher)
(Aparna Gummadi,

PhD student, Department of Education,
University of York.)

(insert name)
(Headteacher at [insert name of school

Consent forms

Appendix.10. Parental consent form

THE UNIVERSITY of York

DEPARTMENT OF EDUCATION
Heslington, York, YO10 5DD

Direct Line: (01904) 323455
Fax: (01904) 323459
Email: educ525@york.ac.uk
Web: www.york.ac.uk/educ

Parental Consent form

What will be involved in participation?
I understand that:

- The purpose of the proposed study is to assess nutritional education in early years settings.
- The study involves participating in 10-minute games, answering simple questions and the researcher going through Learning Journals. A voice recorder will be used during the process and the researcher will take written notes.
- The researcher has an enhanced Disclosure and Barring Service (DBS) check and wherever possible one of the staff members will be present.
- The researcher will not comment on my child's responses at any stage but will only positively encourage my child to give responses.
- My child can stop at any time during the process.

How will my data be handled?
I understand that:

- My child's participation is voluntary, and I may withdraw my child, or their data or both my child and their data before [30/6/2016] by informing the researcher [Aparna Gummadi (ag1263@york.ac.uk)] without any penalty being imposed on me.
- Only the researcher will have access to the data and information collected in this study before it is anonymised (which means to remove identifying particulars or details). All personal data will be securely stored and destroyed once anonymized.
- The researcher will anonymize the data and will not disclose any personal information unless in the unlikely event of being morally or legally obliged to alert relevant external authorities.
- Tutors in the Department of Education at the University of York will only have access to the anonymised data.
- The anonymised data will be archived and may be used for other academic and research purposes by other researchers inside and outside the University.
- The anonymised data may be disseminated through seminars, conference presentations, journal articles and other scholarly publications.
- The data will only be used for academic and research purposes.

What should I do if I have questions or concerns?
I understand that:

- This project has been reviewed by and received ethics clearance through the ethics committee in the Department of Education at the University of York.
- If I have any questions about this research, I should in the first instance contact the researcher, Aparna Gummadi (ag1263@york.ac.uk) or her supervisor, Dr Jeremy Airey (jeremy.airey@york.ac.uk)
- If I have any concerns about the conduct of this research, I may contact the Chair of the Education Ethics Committee at education-research-administrator@york.ac.uk.

Consent forms

TO BE COMPLETED BY PARENT/GUARDIAN

Child's Name _____
Age_____

I have read and understood the accompanying letter and discussed participation with my child and I give permission for the child named above to be included.

Name _____ Relationship to child _____

Signature _____
Date_____

PLEASE KEEP THE ACCOMPANYING LETTER FOR YOUR RECORDS AND ONLY THIS FORM (Page) MUST BE COMPLETED AND RETURNED TO THE SCHOOL RECEPTION FOR THE NAMED CHILD TO BE INCLUDED IN THIS STUDY. THANK YOU!

Please return this form by date: ---/----/2016

Further information about the study is contained in the enclosed letter for children and parents/guardians.

Consent forms

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