

**Statin-use and the adoption of healthy lifestyle choices:
A cross-national comparison**

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

Background: Statin-use and the adoption of healthy lifestyle choices are important components of cardiovascular disease prevention. The nature of the relationship between the former and the latter, and the influence of personal and social factors on this relationship remains unclear.

Aim: This research aimed to examine whether statin-use influences the adoption of healthy dietary and exercise choices by changing the way people think of high cholesterol as a risk factor for cardiovascular disease in the context of their social world.

Methods: Questionnaires were used to compare the dietary and exercise behaviours; perceptions of high cholesterol; and perceived future risk of cardiovascular disease of statin users and non-statin users recruited in Nigeria and in the UK. In-depth interviews were conducted in each country to explore between group differences and the influence of social factors on statin-use, adoption of a healthy lifestyle choices; perceptions of high cholesterol, future cardiovascular disease risk and availability of social support.

Results: A similar proportion of the 148 participants recruited from Nigeria and the 89 participants recruited from the UK reportedly adopted a low-fat diet, 69% and 70% respectively. Reported adoption of healthy exercise behaviours was much lower and notably different between the country samples, 16% and 32% respectively. Statin-use was found to influence the adoption of healthy lifestyle choices in 3 ways: it was found to encourage, hinder, and work alongside the adoption of healthy lifestyle choices. The adoption of healthy lifestyle choices was also influenced by cause-control perceptions, gender, and social factors such as location, preferences and demands of other people, and societal norms such as body image ideals.

Conclusion: Statin-use influenced the adoption of healthy lifestyle choices in 3 different ways. Dietary changes were preferred to exercise changes. Illness perceptions and preferences of the individual and their social world influenced statin-use and the adoption of healthy lifestyle choices.

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List of Abbreviations

ASCOT	Anglo-Scandinavian Cardiac Outcome Trial
BMI	Body Mass Index
CHD	Coronary heart disease
CRHQ	The Cognitive Representation of Hypercholesterolemia Questionnaire
CSM	Common Sense Model
CVD	Cardiovascular disease
EPIC	European Prospective Investigation of Cancer and Nutrition study
FCT	Federal Capital Territory
FFQ	Food Frequency Questionnaire
GPPAQ	General Practice Physical Activity Questionnaire
kg/m ²	kilograms per meters squared
HAART	Highly Active Antiretroviral Therapy
HBM	Health Belief Model
HDL	High density lipoprotein
HIV	Human Immunodeficiency Virus
HTN	Hypertension
IPQ	Illness Perception Questionnaire
IPQR	Revised Illness Perception Questionnaire
LB	Lifestyle behaviours
LIGHT	Leeds Institute for Genetics, Health and Therapeutics
LIHS	Leeds Institute of Health Sciences
LIMM	Leeds Institute of Molecular Medicine
MA	Medication adherence
mg	milligrams
mmol/L	millimoles per litre
MOPD	Medical Outpatients Department
MOS	Medical Outcome Study
NA	No association
NHANES	National Health and Nutrition Examination Survey.
NICE	National Institute for Health and Care Excellence
NNPC	Nigerian National Petroleum Corporation

NRES	National Research Ethics Service
NUGA	Nigerian University Games Association
SD	Standard deviation
SMB	Stress management behaviours
SPSS	Statistical Package for the Social Sciences
SRB	Stress reducing behaviours
SYC	South Yorkshire Cohort
UCTH	University of Calabar Teaching Hospital
UK	United Kingdom
WHO	World Health Organisation
%	Percent
χ^2	Chi Square
\geq	Greater-than or equal to
<	Less-than

Chapter 1 : Introduction

1.1 Chapter overview

This chapter begins with an introduction to non-communicable diseases and cardiovascular disease globally, in Nigeria and in the UK. It then describes the prevalence of cardiovascular disease risk factors in both countries and the primary prevention strategies employed by these countries. This chapter concludes with a discussion of the rationale for this research.

1.2 Introduction to non-communicable diseases

Non-communicable diseases are a major cause of morbidity and mortality worldwide. It is estimated that 68% of the 56-million global deaths in 2012 were caused by non-communicable diseases, 40% of these deaths were people under the age of 70-years and almost three quarters of the former occurred in low-and-middle-income countries (World Health Organisation, 2014). Non-communicable diseases have now been recognised as a growing public health problem in developing countries. These countries are currently thought to be facing the “double burden” of a rise in non-communicable diseases alongside a high prevalence of infectious diseases (Makusidi et al., 2013). The 4 major non-communicable diseases responsible for 82% of deaths are: cardiovascular disease, cancers, respiratory diseases and diabetes (World Health Organisation, 2014).

1.3 Introduction to cardiovascular disease

Cardiovascular disease (CVD) is a term used to collectively describe diseases of the heart and circulatory system (Scarborough et al., 2010). Cardiovascular disease caused 46% of the 56-million global deaths in 2012 (World Health Organisation, 2014). In Nigeria, cardiovascular disease caused 42% of deaths from non-communicable diseases in people under 60-years of age in 2008 (World Health Organisation, 2011). In the United Kingdom (UK), 28% of all deaths in 2012 were due to cardiovascular diseases, making it one of the most common causes of deaths in the UK, second only to cancer (29%)(Townsend et al., 2014). A quarter of deaths from cardiovascular disease in males and 18% in females in the UK in 2012 occurred in people under the age of 75-years (Townsend et al., 2014). Although mortality from cardiovascular disease in the UK appears to be falling, cardiovascular

disease related morbidity appears to be on the rise. In addition to the human cost, cardiovascular disease is thought to have cost NHS England almost £8000 million in the year 2010 (National Institute for Health and Care Excellence, 2014).

1.3.1 Cardiovascular disease risk factors

The risk factors for cardiovascular disease can be classified into 4 groups namely: inherent, behavioural, physiological and psychosocial risk factors as shown in Figure 1.1. Inherent risk factors are non-modifiable thus tend to be overlooked in the vast majority of literature (Najjar and Lakatta, 2005). However, the single most powerful risk factor for cardiovascular disease is ageing, an inherent factor (Najjar and Lakatta, 2005, World Health Organisation et al., 2011). Long term exposure to behavioural risk factors: unhealthy diet, physical inactivity, tobacco use and harmful alcohol use lead to the development of physiological risk factors such as hypertension, high serum lipid levels and diabetes which are essentially intermediate factors that promote and determine the rate of progression of the atherosclerotic process that leads to the development of cardiovascular disease (World Health Organisation, 2010, World Health Organisation et al., 2011). Behavioural risk factors are modifiable consequently, a significant proportion of cardiovascular disease and other non-communicable diseases can be prevented by the reduction of these 4 behavioural risk factors (World Health Organisation, 2010).

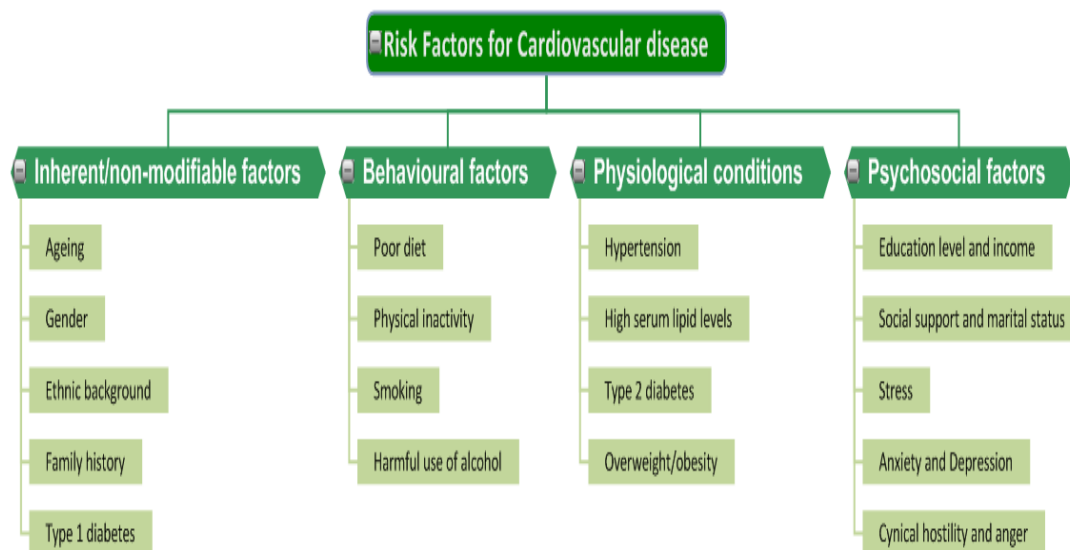


Figure 1.1: Classification of cardiovascular disease risk factors.

(Brannon and Feist, 2007, British Nutrition Foundation, 2005, World Health Organisation et al., 2011).

1.3.2 Cardiovascular risk factors in Nigeria

Nigeria is one of the many countries in sub-Saharan Africa that is currently undergoing the epidemiological transition from infectious diseases to non-communicable diseases (Dahiru et al., 2008). Although infectious diseases such as malaria, Human Immunodeficiency Virus (HIV) and tuberculosis still remain prevalent, Nigeria has managed, to some extent, to control these infectious diseases and malnutrition. This has led to an increase in life expectancy and thus an older population (Awosan et al., 2013b). Nigeria has also experienced rapid urbanisation and rural-to-urban migration. This has caused changes to the demographic, environmental and social factors that encourage the lifestyle changes that are postulated to have led to the current rise in cardiovascular diseases and its risk factors (Dahiru et al., 2008, Oladapo et al., 2010, Makusidi et al., 2013). For example, the traditional African diet, which is rich in carbohydrates, fruits and vegetables, has a high fibre content, moderate oil, predominantly in the form of palm oil and average salt is being increasingly replaced by a western diet of fast foods, rich in animal fat, salt and low in complex carbohydrates (Ulasi et al., 2010, Makusidi et al., 2013). An increase in the use of cars and other vehicles have led to less physical activity and thus more sedentary lifestyles (Oladapo et al., 2010). These behaviours as well as increased alcohol consumption and tobacco use are thought to have led to a rise in cardiovascular risk factors such as hypertension, diabetes, obesity and high cholesterol (Oladapo et al., 2010, Dahiru.T and Ejembi.CL, 2013, Nwaneli, 2013).

A high prevalence of cardiovascular disease risk factors is often reported in Nigerians of a high socioeconomic class, who appear to have adopted a western lifestyle (Oladapo et al., 2010, Ordinioha and Brisibe, 2013). However, there is evidence to suggest that rural areas of Nigeria and sub-Saharan Africa are undergoing an epidemiological transition, albeit at a slower pace, depending on how readily individual communities and sub-sets of communities adopt a western lifestyle (Oladapo et al., 2010, Ordinioha and Brisibe, 2013).

Various reports show a high prevalence of cardiovascular risk factors in Nigeria. The World Health Organisation (WHO) estimates the prevalence of elevated blood pressure to be 43%, overweight 27%, hypercholesterolemia 16%, elevated blood glucose 9%, obesity 7% and daily tobacco use 5% (World Health Organisation, 2011). Hypertension appears to be the most prevalent cardiovascular risk factor in

Nigeria and many other African countries. It is thought to affect between 15-30% of Nigeria's population. The prevalence of the other cardiovascular disease risk factors remains unclear (Oladapo et al., 2010). Despite the high prevalence of cardiovascular disease risk factors, the prevalence of coronary heart disease remains rather low and whilst the prevalence of coronary heart disease appears to have been on the rise over the past decade, it still remains relatively uncommon in Nigeria (Nwaneli, 2013, Yekeen et al., 2003).

Unfortunately, the high prevalence of cardiovascular risk factors is accompanied by a lack of knowledge of cardiovascular disease and its risk factors (Awosan et al., 2013b, Awosan et al., 2013c, Makusidi et al., 2013). One study reported that 57% of its 216 participants had poor knowledge of cardiovascular disease risk factors while 71% had poor knowledge of the signs and symptoms of cardiovascular disease (Awosan et al., 2013b). The lack of knowledge and low rates of detection and treatment of cardiovascular disease risk factors, result in higher rates of complications and cardiovascular events, which leads to loss of life, lowers life expectancy and increases the burden on an already over-burdened healthcare system (Oladapo et al., 2010, Makusidi et al., 2013).

Despite the high prevalence of cardiovascular disease risk factors in Nigeria, there is a dearth of information on the prevalence and patterns of cardiovascular disease and its risk factors particularly in rural areas of Nigeria (Oladapo et al., 2010, Sani et al., 2010). This is true of sub-Saharan Africa generally and it is thought to be for 2 reasons: firstly, because of the greater emphasis placed on infectious diseases and secondly, because the role of cardiovascular disease and its risk factors in sub-Saharan Africa is largely underestimated and, until recently, has been thought to be a problem of affluent developed countries (Ojji et al., 2013, Okpechi et al., 2013). However, recently, as a result of an awareness of the double burden of non-communicable diseases and infectious diseases in sub-Saharan Africa, many countries in the region have begun to increase surveillance and gather data on the prevalence and patterns of cardiovascular diseases and its risk factors (Okpechi et al., 2013). The last large national survey done on non-communicable diseases in Nigeria was carried out in 1997. It is likely that, given the rapid urbanisation, communicable disease control and rural-to-urban migration that has occurred in Nigeria, the prevalence and patterns of cardiovascular disease and its risk factors may have changed since the survey was conducted. To paint a more recent picture

of the prevalence and patterns of cardiovascular disease risk factors, the findings of studies that have investigated the prevalence and/or patterns of: hypertension; overweight and obesity; diabetes and dyslipidaemia in Nigeria are presented below.

Hypertension

Hypertension is the most common non-communicable disease in Nigeria with a WHO estimated prevalence of 43% in 2008 (Oladapo et al., 2010, World Health Organisation, 2011). These estimates appear to be in-line with the findings of most studies conducted in Nigeria. Most studies report the prevalence of hypertension to range between 10% and 47% (Awobusuyi et al., 2011, Olatunbosun et al., 2000). However, a study conducted by Ordinioha and Brisibe found a prevalence of 69% (Ordinioha and Brisibe, 2013). This study was carried out using male traditional chiefs in the oil rich South-South region of Nigeria (Ordinioha and Brisibe, 2013). These chiefs are likely to have worked very closely with oil companies and thus would have been very exposed to western lifestyles. Furthermore, no females were included in this study and the mean age of participants was much higher than that of the other studies. Needless to say, the findings of this particular study are not generalizable.

While there is a general lack of knowledge about cardiovascular risk factors and low rates of detection, awareness seems to be greatest about hypertension. Studies carried out in North-West Nigeria, found that 43% of 216 teachers and 55% of 210 bankers and teachers knew that hypertension was a risk factor for cardiovascular disease (Awosan et al., 2013b, Awosan et al., 2013c). However, detection rates are low, with one study reporting that only 23% of participants were aware of their hypertension (Makusidi et al., 2013) whilst another, reported that 41% of hypertensives were aware of their elevated blood pressure (Okpechi et al., 2013). Consequently, many newly diagnosed hypertensives present with organ damage which implies that hypertension is often first diagnosed after renal complications or cardiovascular disease has already occurred (Okpechi et al., 2013).

Overweight and Obesity

The WHO estimated prevalence of overweight and obesity in Nigeria in 2008 was 27% and 7% respectively (World Health Organisation, 2011). The prevalence of overweight and obesity in most studies ranged between 6% - 46% and 6% - 28% respectively (Awosan et al., 2013b, National Population Commission and ICT

Macro, 2009) . These wide ranges are not surprising as these studies were conducted in different populations with different characteristics. The Nigerian demographic health survey found that the prevalence of overweight/obesity in females aged between 15 - 49years varied markedly across the 6 geo-political regions of Nigeria, ranging between 13% in the North-East to 30% in the South-East of Nigeria (National Population Commission and ICT Macro, 2009). Furthermore, a study conducted by the Nigerian Heart Foundation and the 2008 Nigeria demographics and health survey found that being overweight or obese was more prevalent in urban areas than in rural areas. (Nigerian Heart Foundation et al., 2003, National Population Commission and ICT Macro, 2009).

Many developing countries have experienced an increase in obesity-related morbidity. This is attributed to the sedentary lifestyles and high calorie diets encouraged by urbanisation, and is called a nutritional transition (Bakari et al., 2007, Amole et al., 2013). Sadly, this means that obesity-related morbidity, co-exist alongside undernutrition-related morbidity, creating a double burden of nutritional-related morbidity in developing countries (Amole et al., 2013, Bakari et al., 2007).

Diabetes

Nigeria ranked number one on the International Diabetes Federation's list of top 5 countries with the highest prevalence of diabetes in sub-Saharan Africa (Awosan et al., 2014). However, due to lack of data, the prevalence of diabetes in Nigeria remains unknown, but the data that is available suggests that diabetes is a growing public health problem in Nigeria and many other countries in sub-Saharan Africa (Nyenwe et al., 2003).

The WHO estimated that in 2008, 9% (7% males, 10% females) of Nigerians had elevated blood glucose levels, no estimated prevalence of diabetes was reported (World Health Organisation, 2011). The prevalence of diabetes in the literature ranges between 0.9% -11% (Awosan et al., 2013c). This is consistent with the 0.5% -10% estimate provided for Africa as a whole (Nwaneli, 2013). However, it should be noted, that the prevalence of 0.9% was found in a study that relied on participants to self-report prior diagnoses of diabetes (Awobusuyi et al., 2011). Given the high prevalence of undiagnosed diabetes, the use of self-report, is likely to underestimate of the prevalence of diabetes in participants (Odugbemi et al., 2012, Sani et al., 2010) . For example, in Sani's study, 38% of the identified

diabetics were newly diagnosed (Sani et al., 2010). The only study identified that found a higher detection rate of diabetes than hypertension, consisted predominantly of females (56%), and reported that diabetes was often diagnosed during antenatal care, and as a result of participants noticing sugar-ants around their toilets (Oladapo et al., 2010).

Diabetes was found to be more prevalent in females than in males (World Health Organisation, 2011, Ogunmola et al., 2013). This is attributed to the higher prevalence of physical inactivity and overweight/obesity in females than in males, both of which are thought to significantly increase the risk of developing type 2 diabetes (Nyenwe et al., 2003, Ogunmola et al., 2013, Ojo and Mohammed, 2013).

Dyslipidaemia

Majority of studies that investigate the prevalence of cardiovascular disease risk factors in Nigeria do not report the prevalence of dyslipidaemia. One article reported that prior to the study, the hospital in which clinical assessments were done, lacked the facilities required to assess lipid profiles and the healthcare providers in that area were poorly educated/aware of the impact of lipids on cardiovascular disease risk (Oladapo et al., 2010).

Most of the studies that investigated the prevalence and patterns of dyslipidaemia in Nigeria found decreased high level lipoproteins (HDL) to be the most common form of dyslipidaemia. The prevalence of decreased HDL in these studies ranged between 9% to 59% (Sani et al., 2010, Ugwuja et al.), with most studies reporting a prevalence of about 30-40% (Awosan et al., 2013a, Dahiru.T and Ejembi.CL, 2013, Ogunmola et al., 2013, Oladapo et al., 2010, Ulasi et al., 2010). The prevalence of decreased HDL is thought to be more common in females than males (Ugwuja et al., Sani et al., 2010, Awosan et al., 2013a). A few authors attribute this in part to overweight/obesity and lack of physical activity, claiming that aerobic exercise and weight-loss are known to increase HDL levels (Awosan et al., 2013a, Ogunmola et al., 2013). Given that evidence suggests that overweight/obesity and physical inactivity are more common in females than males, it is of little surprise that decreased HDL levels appear to be more prevalent in females than in males (Iloh et al., 2011, Odugbemi et al., 2012, Amole et al., 2013, Ogunmola et al., 2013, Ojo and Mohammed, 2013).

1.3.3 Cardiovascular risk factors in the UK

The prevalence of cardiovascular disease risk factors in the UK is well-documented thus will be not described in as much details as was done for prevalence of cardiovascular disease risk factors in Nigeria. According to the statistics from the British Heart Foundation, the prevalence of cardiovascular diseases risk factors in England in 2012 are as follows: 31% of males and 27% of females were hypertensive; 67% of males and 57% of females were overweight; 24% of males and 25% of females were obese; and 7% of males and 5% of females were diabetic (Townsend et al., 2014). Although 3.2 million people in the UK have been diagnosed with diabetes, it is thought that another 850,000 of people are diabetic yet have been undiagnosed by a doctor. In terms of high cholesterol, 44% of males and 43% of females in England in 2011 had total cholesterol levels that were less than 5mmol/L (Townsend et al., 2014).

1.4 Primary prevention of cardiovascular disease

The goal of cardiovascular disease primary prevention is the reduction of risk factors in individuals with no clinically apparent cardiovascular disease (Bailey et al., 2007, National Institute for Health and Clinical Excellence, 2008). High serum lipid levels (hyperlipidaemia) is one of the 3 main risk factors which can be modified to prevent cardiovascular disease (Capewell S et al., 2008, National Institute for Health and Clinical Excellence, 2010) .This research will focus on the primary prevention of cardiovascular disease i.e. the prevention of cardiovascular disease in individuals who do not currently have cardiovascular disease(National Heart Lung and Blood Institute, 2002) by lipid modification.

1.4.1 Nigeria and UK guidelines for lipid modification

At present, Nigeria only has nutritional guidelines for prevention and management of non-communicable diseases. Decisions about the management and prevention of cardiovascular disease are made by medical practitioners and patients based on potential benefits, risks, cost to patients and existing WHO guidelines (World Health Organisation, 2007).

In the UK, according to guidelines by the National Institute for Health and Care Excellence (NICE), individuals with a 10-year cardiovascular disease risk of less than 10% (as calculated by QRISK2) should receive lifestyle advice while

individuals with a cardiovascular disease risk of or greater than 10% should receive lifestyle advice as well as pharmaceutical interventions (National Institute for Health and Care Excellence, 2014).

1.4.2 Pharmaceutical interventions

There are a variety of lipid-lowering drugs that can be used for the prevention of cardiovascular disease namely: statins; fibrates; bile acid sequestrants; nicotinic acids and its derivatives; and cholesterol absorption inhibitors. However, due to its relatively few side effects, statins are the first drug of choice for lipid modification (Opie and Gersh, 2005). Statin therapy is recommended for use in conjunction with lifestyle modification to lower cardiovascular disease risk (Cooper et al., 2008, National Institute for Health and Care Excellence, 2014, National Institute for Health and Clinical Excellence, 2008, National Institute for Health and Clinical Excellence, 2010).

Efficacy of statins

As mentioned above, the management of cardiovascular disease often involves a combination of pharmacotherapy and lifestyle modifications, yet the majority of efficacy studies focus on pharmacotherapy (Dunbar-Jacob et al., 2002, Hertz.J.E, 2013, Royer, 1998). There is a plethora of information available on the effectiveness of lipid-lowering drugs particularly statins for secondary prevention of cardiovascular disease. The body of research available on the efficacy of statins for primary prevention is much less conclusive and is somewhat difficult to interpret as many studies include both primary and secondary prevention data and tend to provide a variety of lifestyle interventions in conjunction with statin-use. However, there is credible evidence that suggests that statins are indeed beneficial for use in the primary prevention of cardiovascular disease. For example, a systematic review of 14 randomized controlled trials comprising 34,272 participants found that statins produced a reduction in cardiovascular disease events and all-cause mortality (Taylor et al., 2011). Opponents of statins claim that studies that use individuals with high initial cardiovascular disease risk are likely to find significant benefits because the initial level of cardiovascular disease risk in participants determines the magnitude of the benefits produced (World Health Organisation, 2007). However, a recent meta-analysis on 174,149 participants with a 5-year cardiovascular disease

risk of less than 10% still found that statins produced a significant reduction in vascular events (Mihaylova et al., 2012).

1.4.3 Lifestyle modifications

There are 4 main lifestyle modifications recommended for lipid modification in the primary prevention of cardiovascular disease by the WHO and NICE and these are:

1. The consumption of a cardio-protective diet i.e. a diet in which total fat intake constitutes less than 30% of total daily energy intake, less than 10% of which should be saturated fats and daily dietary intake of cholesterol should be less than 300mg.
2. A minimum of 30-minutes of moderate intensity physical activity, 5 days a week.
3. Smoking cessation.
4. Consumption of less than 3 - 4 units of alcohol in men and 2 - 3 units in women daily (Cooper et al., 2008, Federal Ministry of Health, 2014, National Institute for Health and Care Excellence, 2014, National Institute for Health and Clinical Excellence, 2010).

Efficacy of lifestyle modifications

There is significantly less information available on the benefits of lifestyle modifications (van der Wal et al., 2005). However, the impact of dietary fat on coronary heart disease is a well-researched area. A systematic review of 27 randomised controlled trials composed of 30,902 person years of observation, found that reduction of dietary fat intake produced a 16% reduction in cardiovascular disease events and a 9% reduction in cardiovascular disease mortality (Hooper and Summerbell, 2001). Several meta-analysis investigating the effects of physical activity on cardiovascular disease have found that in addition to producing a dose-response reduction in cardiovascular disease risk, light-to-moderate physical activity also improves blood pressure, lipid profile, glucose metabolism, psychological wellbeing, quality of life and reduces all-cause mortality (Brannon and Feist, 2007, Thompson and Buchner, 2003, World Health Organisation, 2007). The benefits of smoking cessation is backed by a large body of evidence from prospective cohort studies. A 2003 systematic review found that smoking cessation produced a 36% reduction in total mortality in patients with coronary heart disease (Critchley and Capewell, 2003). Alcohol consumption has been found to have some protective

effects on coronary heart disease risk however, the increased cardiovascular disease risk and all-cause mortality attributed to harmful consumption of alcohol is well-documented (World Health Organisation, 2007). All of these studies show that the impact lifestyle mono-therapy can be substantial however, when combined the benefits become even greater (Mozaffarian et al., 2008).

1.4.4 Synergistic effect of statin-use and lifestyle modifications

Even less researched is the synergistic effect of lifestyle modification and statin-use. A few studies on men diagnosed with high cholesterol found that the effects of a low-fat diet and simvastatin/lovastatin-use were independent of each other and when combined had an additive effect on serum lipid, insulin and antioxidant levels (Antti et al., 2002, Cobb et al., 1991, Hunninghake et al., 1993). This additive effect was also found in a study on familial hypercholesterolemia which is generally thought to be unresponsive to dietary changes (Chisholm et al., 1992). These studies all concluded by highlighting the importance of the combination of diet and statin-use in the prevention of cardiovascular disease.

1.4.5 Research rationale

In addition to the limited research available on the synergistic effect of lifestyle modification and statin-use, there is also a dearth of research on the nature of relationship between statin-use and the adoption of healthy lifestyle choices and much of the research available is conflicting (Mann et al., 2007b, Mann and Natarajan, 2007). Some researchers claim that statin-use may provide a false sense of security, which enables people to neglect the adoption of healthy lifestyle choices and continue to make poor lifestyle choices (Blaha et al., 2012, Joshi et al., 2012, Mann et al., 2007b, Redberg, 2014). Indeed, Sugiyama *et al's* repeated cross-sectional study using American National Health and Nutrition Examination Survey (NHANES) data from 1999-2010 on 27,886 participants found that the fat and total caloric intake of statin users significantly increased over the 10-year study period while no significant increases were observed in non-statin users (Sugiyama et al., 2014). However, this study was not a cohort study and did not follow the same participants over time. The findings of Sugiyama's study contrast with the findings of Mann's study that also used NHANES data but over a shorter period i.e. 1999-2002 and found that statin-users consumed significantly less saturated fat per day than non-statin users (Mann and Natarajan, 2007). These findings were in agreement

with those of a Swedish study on 1458 participants that found that statin users reportedly consumed significantly less fat, ate more fibre and even reported being more physically active than non-statin users (Lytsy et al., 2012). The statin groups in the latter 2 studies that reported better health behaviours also reported more diabetes, hypertension and more cardiovascular events than the non-statin group, thus were not a comparable group. Statin users in these studies may have received more lifestyle advice, perceived more consequences of high cholesterol or felt more susceptible to cardiovascular disease than the non-statin group due to their increased cardiovascular disease risk and thus adopted better health behaviours. Lofgren's study compared the dietary and exercise behaviours of 115 adults aged 60-years and above of a seeming comparable cardiovascular disease risk and found no significant difference in the dietary fat intake and physical activity of statin users and non-statin users (Lofgren et al., 2010). Similarly, a study that followed 71 new statin users over a 6-month period found no significant difference in total caloric or dietary fat intake after 6-months (Mann et al., 2007b). The latter 2 studies that found no significant differences in the fat intake of statin users and non-statin users were relatively small in size thus may have lacked the power to detect modest associations.

As statin-use increases, it is important to assess whether there is a relationship between statin-use and the adoption of healthy lifestyle choices and to elucidate the nature of this relationship for a variety of reasons: firstly, because whilst statins have been found to produce a moderate reduction in cardiovascular disease risk, this effect is enhanced when combined with lifestyle modifications (Chiuve et al., 2006, Cobb et al., 1991, Hunninghake et al., 1993). Secondly, the adoption of healthy lifestyle choices are beneficial not only for the control of lipid levels but also for the control of other cardiovascular disease risk factors; control of other non-communicable diseases; and promote overall health and wellbeing (Mozaffarian et al., 2008, World Health Organisation, 2010, World Health Organisation et al., 2011).

Chapter 2 : Theoretical framework

2.1 Chapter overview

This chapter will present the theoretical framework that guided this research. A description of each theory will be presented alongside the rationale for its use in this research. Empirical support for each theory will be presented and will be followed by a description of how each theory will be applied to this research.

2.2 The Common Sense Model

According to Leventhal's Common Sense Model (CSM) of self-regulation, when faced with a health threat, individual's simultaneously experience an emotional response and produce a cognitive representation of the health threat as shown in Figure 2.1 (Leventhal et al., 2003). This representation informs the choice of coping strategies i.e. the way a health threat is interpreted and determines the way an individual is going to respond/ behave (Leventhal et al., 2003). Therefore, if taking a statin can change the way high cholesterol is represented, it may then inform the choice of coping strategies e.g. adherence to statins and/ or adoption of healthy lifestyle choices.

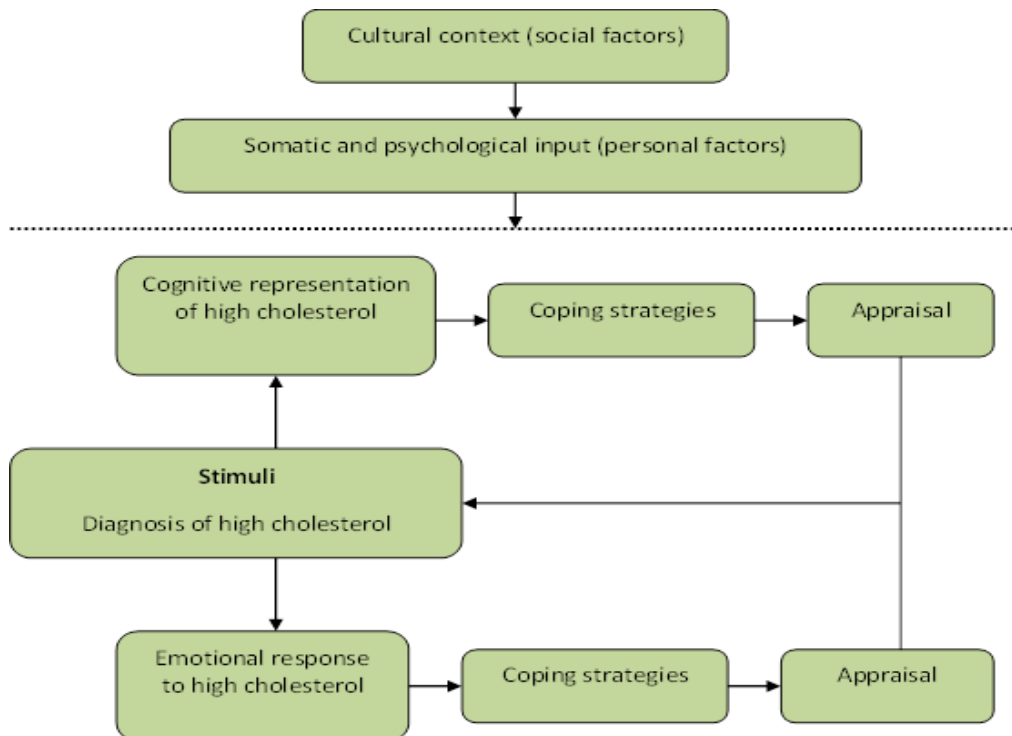


Figure 2.1: Common sense model of illness representation

Adapted from (Diefenbach and Leventhal, 1996, Leventhal et al., 2003, Leventhal et al., 1992).

The CSM posits that the cognitive representation of a health threat is made up of 5 main constructs:

1. Identity: The label and symptoms attributed to the health threat (Hekler et al., 2008).
2. Cause: The perceived causal mechanism of the health threat (Diefenbach and Leventhal, 1996).
3. Timeline: The perceived age of onset or duration of the health threat (Leventhal et al., 2003).
4. Consequences: The perceived impact of the health threat on functional ability and everyday life. This also takes into account the social and economic impact of the health threat not just the physical impact of the health threat (Hagger and Orbell, 2003, Pickett et al., 2013).
5. Control: The perceived responsiveness of the health threat to actions taken by the patient or doctor (Diefenbach and Leventhal, 1996, Hekler et al., 2008). This construct can be further divided into personal control/self-efficacy perceptions and treatment control perceptions (Moss-Morris et al., 2002).

As shown in Figure 2.1, the development of illness representations; the choice of coping strategies employed; and the criteria for appraisal are influenced by personal factors such as: illness history; and personality traits as well as social factors such as socio-cultural factors (Diefenbach and Leventhal, 1996).

2.2.1 Rationale for using the CSM in this research

The CSM was chosen for use in this research for 3 main reasons. Firstly, a considerable amount of research on the CSM focuses on the impact of illness perceptions on health and illness behaviours which is what this research aims to investigate. Secondly, the CSM focuses on the illness perceptions of individuals, thus can ascertain whether they are or are not consistent with medical perspectives. This elucidates potential reasons for non-adherence. Distorted illness perceptions can be then be identified, and targeted by health professionals and public health interventions to improve health and illness behaviours (Coutu et al., 2003, Diefenbach and Leventhal, 1996). Thirdly, the CSM has been found to be a useful model for investigating adherence behaviour (Brannon and Feist, 2007, Brewer et al., 2002, Hagger and Orbell, 2003, Ross et al., 2004). Adherence is a coping strategy i.e. health behaviours employed to reduce/eliminate a health threat. Several studies have used the CSM to investigate adherence in people diagnosed with hypertension

and have found it to be useful in research that aims to use psychological constructs to predict adherence. Much like hypertension, high cholesterol is an asymptomatic, chronic cardiovascular disease risk factor that requires both medication-use and lifestyle changes as suitable control strategies. Therefore, applying the CSM to high cholesterol may indeed be beneficial (Brewer et al., 2002).

2.2.2 Empirical evidence using the CSM

CSM and high cholesterol

A systematic search (see appendix A), found that 2 studies had used the CSM to assess illness perceptions in participants diagnosed with high cholesterol (Brewer et al., 2002, Coutu et al., 2003). One study focused solely on adherence to medication, while the other focused mainly on the adoption of healthy lifestyle choices. Both studies found a positive association between perceived consequences and the adoption of healthy dietary behaviours and medication adherence. However, only one of these studies found that cause and control perceptions clustered together. These study found the CSM to be a useful exploratory tool for investigating adherence in individuals with high cholesterol (Brewer et al., 2002, Coutu et al., 2003).

CSM and hypertension

Research has found that the cause and control constructs tend to cluster together to form lay-models of illness which may determine the choice of coping strategies employed (Hekler et al., 2008). For example, a 2009 study by Hekler *et al*, found that the belief that hypertension was caused by biomedical and lifestyle factors was associated with adoption of healthy lifestyle behaviours, whilst the belief that hypertension was caused by stress was associated with the performance of stress-reducing activities as shown in

Table 2.1 (Hekler et al., 2008). Cause-control models that emphasize biomedical factors have been found in some studies to be positively associated with medication adherence. Cause-control models that emphasize social and environmental factors have been negatively associated with medication adherence but positively associated with other coping strategies. Chen *et al* found that adherence to antihypertensive medications was predicted by risk factor casual attributions and strong treatment control perceptions. Adherence to self-management (diet, exercise and appointment keeping), was predicted by cultural risk attributions and strong personal control perceptions as shown in

Table 2.1 (Chen et al., 2009) . Similarly, Ross *et al* found that strong treatment

control perceptions were positively associated with medication adherence whilst strong personal control perceptions were negatively associated with medication adherence (Ross et al., 2004)(see Table 2.1). This however is not always the case. In Hekler's study, the only significant predictor of medication adherence was age (Hekler et al., 2008). Similarly, Ross *et al* found age to be the most predictive factor of adherence to antihypertensive medications and concluded that impact of age on adherence may be mediated by illness beliefs (Ross et al., 2004) .

2.2.3 Application of the CSM in this research

The CSM will be used to describe and assess the differences in the illness representations of statin users and non-statin users, specifically examining:

- Whether statins users have a more biomedical lay model of high cholesterol than non-statin users?
- Whether statin users have stronger treatment control perceptions than non-statin users?
- Whether non-statin users have weaker personal control perceptions than statin users?

Study	Setting	Sample	Tool and constructs	Findings
High Cholesterol				
Brewer 2002	USA University based hospital Postal survey Cross sectional study	n=169 mean age=67 years 61% male 85% white 49% CHD 49% hypertension 21% diabetes	Study designed tool <u>Constructs examined</u> Identity Consequences Timeline Cause Cure MA	NA +ve association with MA NA NA NA 69%
Coutu 2003	Canada Lipid clinic Specialist heart disease hospital Longitudinal study 1year	n=319 57% male mean age males= 50 years mean age females=55 years 49% diet only 50% diet + medication	CRHQ <u>Constructs examined</u> Identity Consequences Timeline Cause	+ve association with reduced fat intake +ve association with reduced fat intake cause+ consequence predicted improved diet

Hypertension studies

<p>Chen 2009</p>	<p>Taiwan CVD clinic in 2 teaching hospitals</p>	<p>n=277 60% male mean age= 66 years average of 10 years with HTN 20% diabetes 37% high cholesterol 53% family history of HTN</p>	<p>IPQ-R</p> <p><u>Constructs examined</u></p> <p>Identity</p> <p>Consequences</p> <p><i>Timeline</i></p> <p>Chronicity</p> <p>Cyclical</p> <p><i>Cause</i></p> <p>Risk factors (diet etc)</p> <p>Psychological (stress)</p> <p>Cultural attribution</p> <p>Balance attribution</p> <p>Personal control</p> <p>Treatment control</p> <p>MA</p> <p>SMB</p>	<p>NA</p> <p>-ve correlation with MA</p> <p>+ve correlation with SMB</p> <p>-ve correlation with MA</p> <p>+ve association with MA</p> <p>-ve association with MA</p> <p>-ve association with SMB</p> <p>-ve association with SMB</p> <p>+ve association with SMB</p> <p>+ve association with MA</p> <p>82%</p> <p>63%</p>
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<p>Hekler 2008</p>	<p>USA Outpatients in New Jersey Structured interviews</p>	<p>n=102 34% male 100% African American 88% taking antihypertensive 83% overweight/obese average of 19 years with HTN</p>	<p>Study developed tool <u>Constructs examined</u> Identity Consequences Timeline <i>Cause-control</i> Medical belief model Stress belief model MA SRB LB</p>	<p>NA -ve association with SRB NA +ve association LB +ve association with SRB 50% 71%</p>
<p>Horne 2010</p>	<p>UK Brighton arm of ASCOT</p>	<p>n=230 88% males mean age=67years</p>	<p>IPQ-R <u>Constructs examined</u> <i>Cause-control</i> Medical model MA</p>	<p>+ correlation with MA 99.5%</p>

<p>Hsiao 2012</p>	<p>Taiwan Family clinic Cross-sectional</p>	<p>n=117 67% male mean age= 54 years 29% high cholesterol 24% diabetes</p>	<p>IPQ-R <u>Constructs examined</u> <i>Cluster 1</i> Acute timeline Less consequences Low emotional response weak personal control MA</p>	<p>Best MA</p>
<p>Meyer 1985</p>	<p>USA Primary care and renal clinic Milwaukee clinic Downtown hypertension program Structured interview</p>	<p>n=220 45% male mean age= 47 years 60%</p>	<p>Study developed tool <u>Constructs examined</u> Identity Timeline Cause MA</p>	<p>relief of symptoms positively associated with MA +ve association with MA NA</p>

Pickett 2013	USA Multiple community sites, Detroit	n=111 46%males mean age=52 years 100% African American average of 13 years with HTN 87% on antihypertensive	IPQ-R <u>Constructs examined</u> Consequences <i>Timeline</i> Chronicity Cyclical <i>Cause</i> Stress External (chance) Risk factors (diet) Personal control Treatment control Illness coherence MA SMB Exercise Diet SRB	NA +ve association with MA NA -ve association with medical appointment keeping -ve association with healthy diet NA -ve association with SRB NA predictor of SMB 64% 40% 20%
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Ross 2004	UK Secondary hypertension clinic Shared care scheme	n=514 52% male mean age= 60years 39% CVD 10% diabetes	IPQ-R Constructs examined: Consequences <i>Timeline</i> Chronicity Cyclical <i>Cause</i> Psychological Risk factors Immunological Chance Personal control Treatment control Illness coherence Emotional response MA	-ve correlation with MA NA NA NA NA NA NA -ve association with MA +ve correlation with MA NA -ve association with MA
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Table 2.1: Table of studies using CSM to investigate adherence in high cholesterol and hypertension

HTN= hypertension; LB=lifestyle behaviours; MA=medication adherence; NA=no association; SMB= self-management behaviours; SRB= stress-reduction behaviours.

2.3 Health Belief Model

The Health Belief Model (HBM) is a psychosocial model that was originally developed to explain/predict preventive health behaviours in healthy individuals and to detect disease in asymptomatic individuals (Rosenstock, 1974). According to Becker and Rosenstock, there are 4 beliefs that can be used to predict health behaviour:

1. Perceived susceptibility to health threat: The individual's perceived risk of developing the health threat (Rosenstock, 1974).
2. Perceived severity of health threat: The individual's perceived seriousness of the medical, social, economic and emotional consequences of the health threat (Rosenstock, 1974).
3. Perceived benefits of preventive action: The individual's perceived effectiveness of the various actions required to reduce/eliminate the health threat (Rosenstock, 1974).
4. Perceived barrier to preventive action: The individual's perceived negative aspects associated with the various actions required to reduce/eliminate the health threat (Rosenstock, 1974).

A cue to action is required to trigger the activation of the above variables (Abraham and Sheeran, 2005, Rosenstock, 1974). There are an additional 3 modifying factors which are thought to indirectly affect behaviour by influencing individual perceptions. These are: demographic factors e.g. age; socio-cultural factors e.g. social class and; structural variables e.g. knowledge and prior experience of the health threat (Rosenstock, 1974).

2.3.1 Rationale for using the HBM in this research

The HBM was chosen for use in this research for 3 main reasons. Firstly, there is a considerably large body of literature from reviews and studies that provide empirical support for the ability of HBM to predict health, illness and sick role behaviour (Abraham and Sheeran, 2005, Harrison et al., 1992, Janz and Becker, 1984, Rosenstock, 1974, Strecher et al., 1997). It should however be noted that there are no clear guidelines on how to operationalise the 4 main health beliefs and the modifying factors. Consequently, the HBM tends to be operationalised differently across studies making it difficult to generalise study findings. In addition, the large number of variables and the lack of systematic integration of these variables have

led many researchers to view the HBM as an organising framework rather than a complete model (Abraham and Sheeran, 2005, Brannon and Feist, 2007, Stein et al., 1992). Despite these limitations, the ability of HBM to still predict health behaviours is an indication of its robustness (Janz and Becker, 1984, Strecher et al., 1997). The HBM is able to predict complex health behaviours such as lifestyle modifications and adherence to medical regimens which will be investigated in this research (Becker et al., 1977, Janz and Becker, 1984, Kasl, 1974, Strecher et al., 1997). Secondly, the HBM has been used to study chronic illnesses such as hypertension and diabetes and has already been used to assess predictors of coronary heart disease preventive behaviours (Abraham and Sheeran, 2005, Janz and Becker, 1984, Kasl, 1974). A major shortcoming of the HBM is the lack of integration of the modifying factors in predicting health behaviour. However, as the influence of social factors will be explored in this research, this limitation is negated (Ali, 2002). Finally, the HBM has the practical benefit of focusing on individual perceptions of health, illness and treatment which can be modified by public health interventions (Abraham and Sheeran, 2005).

2.3.2 Empirical evidence using the HBM

A systematic review of 24 studies found that perceived barriers to action was the most powerful predictor factor of health behaviours. Perceived severity of the health threat was the weakest predictor of health behaviours. Perceived susceptibility to the health threat and perceived benefits of the required action were found to be equally as predictive. However, the former appears to exert a greater influence on preventive health behaviours and the latter on sick role behaviours (Janz and Becker, 1984). Similar findings have been reported in the wealth of information on the use of the HBM to predict a myriad of health behaviours. Perceived barriers and benefits continually immerse as predictive factors whilst some variation is seen in the predictive ability of perceived susceptibility. However, in the vast literature, HBM variables tend to be operationalised differently across studies making it difficult to generalise study findings and this may account for the discrepancies seen between studies (Abraham and Sheeran, 2005, Brannon and Feist, 2007, Stein et al., 1992).

2.3.3 Application of the HBM in this research

The HBM will be used to describe and examine the differences in the way statin users and non-statin users perceive their future risk of cardiovascular disease, specifically examining:

- Whether statin users feel more/less susceptible to cardiovascular disease than non-statin users?
- Whether statin users perceive more/less benefits of adopting healthy lifestyle choices than non-statin users?
- Whether statin users perceive more/less barriers to adopting healthy lifestyle choices than non-statin users?

2.4 Social Support

Social support is a multi-faceted variable that can be conceptualised in 2 distinct ways (Sarason et al., 1990). Cassel's conceptualisation of social support focuses on the actual social environment of an individual i.e. the structural components of social support such as the size, extensiveness of social network etc. as shown in Figure 2.2. Cobb's conceptualisation focuses on the purpose of social support i.e. the functional components which can be classified into 4 main categories, namely: (Gochman, 1997, Lett et al., 2005, Sarason et al., 1990):

1. Emotional support: The provision of love, care, respect etc. (Cobb, 1976, Lett et al., 2005, Sherborne and Stewart, 1991).
2. Informational/cognitive support: The provision of information, advice or feedback for the evaluation of a situation, one's self and to aid problem-solving (Lett et al., 2005, Sherborne and Stewart, 1991).
3. Tangible/instrumental support: The provision of practical, financial or material aid (Gochman, 1997).
4. Social companionship: The spending of leisure time with individuals in a social network (Sherborne and Stewart, 1991).

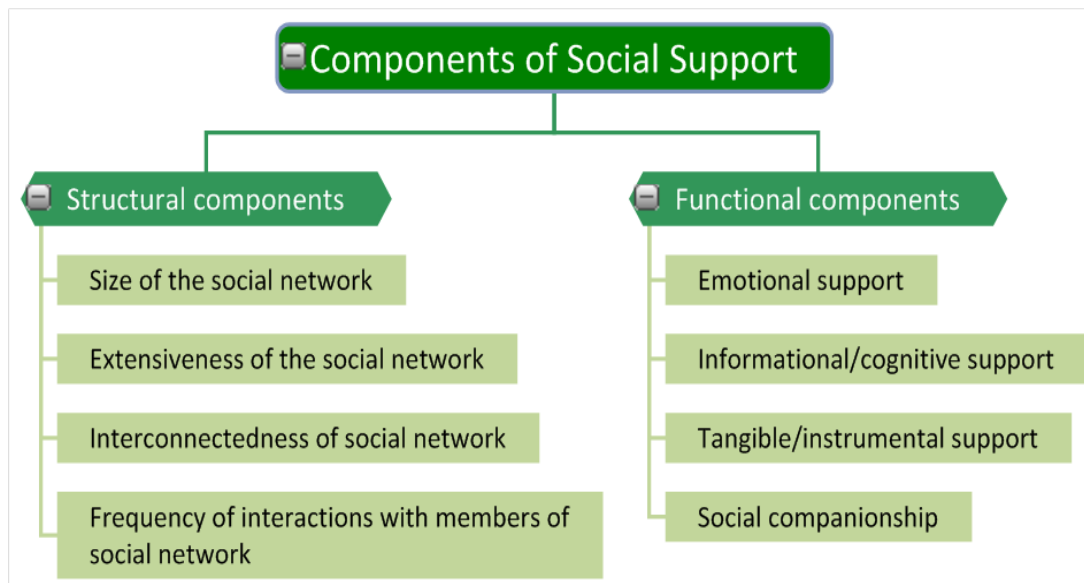


Figure 2.2: Components of social support

2.4.1 Rationale for exploring social support in this research

Social support is thought to influence various health and illness behaviours including symptom reporting, illness recovery, coping strategies, and adherence. Social support has been found to be a determinant of adherence to antihypertensive medications, diabetic regimens, smoking cessation and physical activity programmes (Lett et al., 2005, Schlenk and Hart, 1984). The specific manner by which social support influences adherence remains unclear. Some authors have emphasized the need to explore the role of the various structural and functional components of social support on adherence rather than looking at the role of social support as a whole (Bastone and Kerns, 1995, DiMatteo, 2004).

2.4.2 Empirical evidence using social support

A systematic review of 122 studies investigating the impact of social support on adherence found that people who received tangible support were 4 times more likely to adhere to their prescribed regimens than people who did not receive tangible support. People who received emotional support were 1.4 times more likely to be adherent than those who did not receive emotional support (DiMatteo, 2004). Emotional support is postulated to have a weaker impact on adherence than tangible support because the latter directly promotes adherence whilst the former indirectly promote adherence by increasing self-efficacy (DiMatteo, 2004). Two studies investigating the impact of social support on adherence to cardiac

rehabilitation found tangible support to be predictive of adherence while emotional support not found to predict adherence (Molloy et al., 2008, Moore et al., 2006). Both studies however provided no sample size calculation and may have lacked the power to detect small but significant associations.

2.4.3 Application of social support in this research

This research will explore the impact of taking a statin on social support by specifically exploring:

- Whether statin users perceive that more/less social support is available to them than non-statin users?
- Whether statin users perceive that more/less tangible support is available to them than non-statin users?
- Whether statin users perceive that more/less emotional support is available to them than non-statin users?
- How culture impacts on the perceived availability of social support.

2.5 Wider sociocultural factors

The sociocultural context of an individual provides the lens through which the world is seen and understood (Helman, 2007, Liu, 1986). It guides many aspects of daily life such as our interactions with others, thus it influences the way social support is sought and received (Kim et al., 2006). Socio-cultural factors mould perceptions of beauty and body image (Ussher, 2000). They also influence dietary behaviours such the types of foods consumed, when, where and by whom food is consumed (Helman, 2007). Sociocultural factors influence the types of exercise engaged in and by whom (Scully, 1998). Sociocultural factors also influence perceptions of health and illness. Indeed, both the CSM and HBM acknowledge the modifying role of sociocultural factors on illness perceptions. The CSM posits that illness representations are formed from 3 sources: 1) sociocultural knowledge; 2) influence of other members of ones' social world e.g. doctors, spouses and so on; and 3) direct experience with the illness (Godoy-Izquierdo et al., 2007). As the illness perceptions and health behaviours such as diet and exercise are influenced by social factors, it is important to explore these perceptions and behaviours within their social context. This has rarely been explored (Chen et al., 2009).

2.5.1 Application of wider sociocultural factors in this research

This research will explore the influence of social factors on:

- Stain-use
- The adoption of low-fat diet and healthy exercise behaviours
- Perceptions of high cholesterol and future risk of cardiovascular disease
- Perceived availability of social support

This chapter described the CSM, HBM, social support and wider cultural factors, explained why they were used in this research and detailed their application in this research.

Chapter 3 : Research aims and methodology

3.1 Chapter overview

This chapter begins by stating the aims of this research and the rationale for employing quantitative and qualitative research techniques to fulfil these aims. This chapter will end with a discussion of the role the researcher played in shaping the research process i.e. reflexivity.

3.2 Research aims

The aim of this research was to examine whether statin-use influences the adoption of healthy dietary and exercise choices by changing the way people think of high cholesterol as a risk factor for cardiovascular disease in the context of their social world. This aim consists of 3 main research objectives. The primary objective was to examine the influence of statin-use on the adoption of a low-fat diet and healthy exercise behaviours. The second objective was to examine the influence of statin-use on the way people think about high cholesterol and their future cardiovascular disease risk. The third objective was to examine the influence of illness perceptions on the adoption of a low-fat diet and healthy exercise behaviours. Finally, the fourth objective was to examine the influence of social factors on statin-use; the adoption of a low-fat diet and healthy exercise behaviours; and perceptions of high cholesterol and future risk of cardiovascular diseases. To fulfil these objectives, the following research questions were explored.

3.3 Research questions

1. Is there a difference in the dietary and exercise behaviours of people at risk of cardiovascular disease who are (i) currently taking a statin (statin-users) and (ii) not currently taking a statin (non-statin users)?
2. Do people narrate meaningful accounts of how statin-use influences their dietary and exercise behaviours?
3. Is there a difference in the following illness perceptions of statin users and non-statin users?
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
4. Which of the following factors are significantly associated with the adoption of a low-fat diet and the adoption of healthy exercise behaviours?
 - Statin-use

- Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
 - Perceived availability of social support
5. Do people narrate meaningful accounts of how statin-use influences their perceptions of high cholesterol; perceived future risk of cardiovascular disease; perceived availability of social support; and how this influences their subsequent lifestyle choices?
 6. Do people narrate meaningful accounts of how social factors influence the following?
 - Statin-use
 - Adoption of a low-fat diet and healthy exercise behaviours
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
 7. Are there meaningful differences in the way the Nigeria sample and UK sample narrate the following?
 - Adoption of a low-fat diet and healthy exercise behaviours
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
 - Perceived availability of social support

3.4 Rationale for employing quantitative and qualitative research methods

To fulfil the aims of this research, both quantitative and qualitative research methods were required. Quantitative techniques i.e. a questionnaire were used to obtain and compare numerical descriptions of the dietary and exercise behaviours; perceptions of high cholesterol; perceptions of future risk of cardiovascular disease; and perceived availability of social support in statin users and non-statin users (Bryman, 2008). However, this only paints a picture of what these behaviours and perceptions are and how they differ between groups. To explore the nature and reasons for these behaviours, perceptions and between groups differences, qualitative interviews were conducted (Bryman, 2008). Furthermore, qualitative techniques were required because research aimed to consider health behaviours and illness perceptions in the context of the social world in which they exist.

3.5 Rationale for conducting this research in Nigeria and the UK

This research was conducted in 2 countries to allow for an exploration of the influence of social factors on statin-use; the adoption of a low-fat diet and health exercise behaviours; and perceptions of high cholesterol and future risk of cardiovascular disease. The countries chosen were Nigeria and the UK. Nigeria was chosen because the researcher had access to 2 hospitals where this research could be carried out. In the UK, the South Yorkshire Cohort was chosen because it provided an avenue to recruit a sufficient number of participants given the time, cost and other constraints of a PhD. Furthermore, because of a heritage from both these countries, the researcher had an insider-outsider perspective of both countries. The contrast of the 2 countries was thought to allow for an interesting exploration of the influence of social factors on health behaviours and illness perceptions.

3.6 Reflexivity

The interaction between the interviewer and the interviewee shapes the interview and its content, thus face-to-face interviews are subject to interviewer influence (Walter, 2012). Consequently, it is important for the interviewer to acknowledge her role in the research process not just in terms of the interaction with interviewees but also in relation to question development; analysis and conceptualisation of data; and interpretation and presentation of research findings (Creswell, 2008, Walter, 2012). This process of self-reflection i.e. reflexivity is an honest discussion of how the background of the researcher shaped the design, collection, analysis and interpretation of study data (Creswell, 2008).

For the purpose of this research, the researcher is aware of 3 main factors that may have influenced the research process, namely: ethnicity, age and body size. The researcher is of mixed heritage (Nigeria and UK) and has lived in both countries thus has an insider-outsider perspective of both countries. This meant that the researcher shared some commonalities with participants in both countries yet was not a full member of either. This may have allowed for a more in-depth understanding of the respective populations. Yet it still provides the space that an insider may lack to deter from making assumptions or being too close to the research to be objective and detangle interviewees perspectives from personal perspectives (Dwyer and Buckle, 2009). The ethnicity of the researcher was

particularly questioned by interviewees in the Nigeria study. Most of whom began their conversations with the researcher by inquiring about her ethnicity but seemed to reach the conclusion that she was a member of their community to some extent. This may have created some sense of membership that allowed participants to be a bit more open than they may have been with a complete outsider.

The researcher was much younger than majority of participants in both studies. This was particularly relevant in the UK study where interviewees would further explain certain topics because they believed the researcher was too young to have experienced or comprehend, and thus felt the need to further educate her in preparation for her aging process. Furthermore, unlike the researcher, majority of interviewees were overweight or obese. This was particularly relevant among female interviewees who would refer to the researcher's body size as an indicator of their former size. They would explain how they had put on weight over the years and describe their lifestyle behaviours and the role it had played on their body image. However, during discussions about the barriers to the adoption of healthy lifestyle choices, it was sometimes mentioned or implied that the researcher could not possibly understand the barriers and perceived difficulties due to her current body size. Therefore, while age appeared to elicit richer descriptions and explanations from interviewees, body size in some instances encouraged richer discussions but in some cases restricted rich descriptions and discussions from interviewees.

Chapter 4 : The Nigeria quantitative study (Study 1)

4.1 Chapter overview

This chapter will begin by stating the aims and objectives of the Nigeria quantitative study. This will be followed by a description of the research methods employed to fulfil these aims. The findings of this study will be described in this chapter but will be discussed in chapter 7 alongside a discussion of the findings of the UK quantitative study and the qualitative study conducted with participants recruited from both countries. The limitations of this study will also be presented in chapter 7 alongside the limitations of the other studies conducted as part of this research.

4.2 Study aims

This study aimed to examine whether statin-use associates with the adoption of healthy dietary and exercise choices by changing the way a population of Nigerians think of high cholesterol as a risk factor for cardiovascular disease. To fulfil this aim, the following research questions were investigated:

- 1) Is there a difference in the dietary and exercise behaviours of people at risk of cardiovascular disease who are (i) currently taking a statin (statin users) and (ii) not currently taking a statin (non-statin users)?
- 2) Is there a difference in the following illness perceptions of statin users and non-statin users?
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
- 3) Which of the following variables are significantly associated with the adoption of a low-fat diet and the adoption of healthy exercise behaviours?
 - Statin-use
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
 - Perceived availability of social support

4.3 Methods

In the section below, the study design and setting will be presented. The details of the inclusion and exclusion criteria; minimum sample size calculation; and participant recruitment strategies will also be presented. This section concludes with

a description of the data collection and analysis techniques employed to answer the research questions and fulfil the research aims.

4.3.1 Study design

A cross-sectional study design was used to obtain quantitative descriptions of the dietary and exercise behaviours; perceptions of high cholesterol; perceptions of future risk of cardiovascular disease; and perceived availability of social support from a sample Nigerians at a single point in time using a questionnaire (Bryman, 2008). The details of the questionnaire will be presented under the data collection sub-section 4.3.4.

4.3.2 Study setting

Nigeria is the most populated African country. It is home to over 250 ethnic groups who reside in the country's 6 geo-political zones shown in Figure 4.1. The main ethnic groups in Nigeria are the Yorubas who mainly reside in the South-West; Igbos (South-East); Hausa-Fulanis (North-West); Kanuris (North-East); Tivs (North-Central); and Ijaws (South-South) (Anosike et al., 2009, Falola, 2001, The Independent Newspaper, 2015). The official language of Nigeria is English, but most ethnic groups speak different languages and Pidgin, a combination of English and indigenous languages is also widely spoken (Anosike et al., 2009, Falola, 2001). Adult literacy rates in English in 2010 was 58% for Nigeria as a whole, 65% in males and 51% in females (National Bureau of Statistics, 2010). In terms of religion, 50% of Nigerians are Muslim; 40% Christian; and 10% practice indigenous religions (Central Intelligence Agency, 2015). Islam is the prevailing religion in North-West and North-East Nigeria. Christianity is the predominate religion in the South-West, the South-East and the North-Central zones of Nigeria (Falola, 2001).

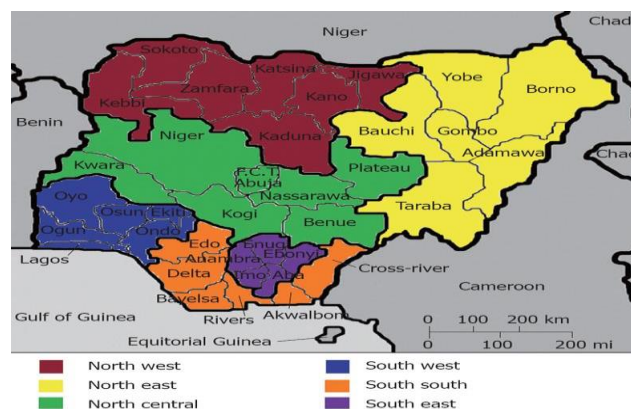


Figure 4.1: Map of Nigeria.

Image taken from Ogah et al 2012

Abuja

This research was conducted in Nigerian National Petroleum Corporation (NNPC) medical services located in the cosmopolitan Maitama district of Abuja. Abuja is located in the North-Central geopolitical zone of Nigeria. It serves as the Federal Capital Territory (FCT) of Nigeria and thus has been exposed to a lot of Western influences. NNPC is the national oil and gas company. It provides free healthcare for its staff and their immediate family. This site will be referred to as the urban research site.

Calabar

This research was also conducted in the University of Calabar Teaching Hospital (UCTH) located in Calabar, the capital of Cross Rivers state. Cross River state is a coastal state located in the oil-rich Niger delta region in the South-South geopolitical zone of Nigeria (Ansa et al., 2008, Anosike et al., 2009). In addition to being an oil-producing state, (Oil Revenue Tracking Initiative, 2014), tourism has become an alternative main avenue of wealth creation for Cross River state (Anosike et al., 2009). It is home to the annual Cross Rivers Christmas Festival and Carnival as well as the Tinapa and Ranch Resort, 2 tourist attractions that have received global attention (Anosike et al., 2009). Consequently, Cross River state is rapidly undergoing urbanisation. This has resulted in changes in the lifestyle of its inhabitants and in its population dynamics (Ansa et al., 2008). For this reason, UCTH will be regarded as the semi-urban research site.

4.3.3 Study participants

To have been considered as eligible for inclusion in this study, participants must have been diagnosed as having high cholesterol; be of Nigerian origin; and must not have experienced a diagnosed cardiovascular event. Individuals who had experience a diagnosed cardiovascular event were excluded because this study aimed to focus on primary prevention. Individuals diagnosed with familial hypercholesterolemia and type I diabetes were excluded from this study due to the significant role of genetics on these conditions. Individuals diagnosed with hypertension, type II diabetes and obesity were included in this study as these conditions are more amenable to behavioural factors such as diet and exercise (World Health Organisation et al., 2011, British Nutrition Foundation, 2005). In addition, individuals diagnosed with HIV were excluded from this study because

some research suggests that HIV and the use of highly active antiretroviral therapy (HAART) may cause metabolic disruptions that lead to dyslipidaemias, hypertension and insulin resistance (Muhammad et al., 2013). Individuals with communication and cognitive difficulties were not included in this study as this would have made completing the questionnaire difficult. Table 4.1 details the main inclusion and exclusion criteria for this study.

Inclusion criteria	Exclusion criteria
✓ Diagnosed high cholesterol	× Diagnosed cardiovascular event
✓ Nigerian origin	× Diagnosed familial hypercholesterolemia
	× Diagnosed type 1 diabetes
	× Diagnosed HIV positive
	× Communication/cognitive difficulties
	× Diagnosed conditions that could lead to secondary hypercholesterolemia (such as liver disease, kidney disease, hypothyroidism)

Table 4.1: Inclusion and exclusion criteria for the Nigeria quantitative study.

4.3.4 Minimum sample size

The minimum sample size required for this study was calculated using the premise that 15 participants were required for each predictor variable included in the regression model (Pallant, 2010). Therefore, the minimum sample size required to perform a reliable logistic regression using 5 predictor variables was 75 participants. An increase in number of recruited participants would have been matched with an increase in the number of variables entered into the regression model using the premise of 15 participants per variable as shown in Table 4.2 below.

Number of variables	Sample size
5	75
7	105
9	135

Table 4.2: Sample size calculation for regression model.

4.3.5 Recruitment procedure

Participants were recruited from 2 research sites namely: Nigeria National Petroleum Corporation (NNPC) medical services and The University of Calabar Teaching Hospital (UCTH) between August and October 2013.

Nigeria National Petroleum Corporation (NNPC) medical services: Urban site

The eligibility criteria was explained to 5 doctors in the NNPC medical services. These doctors were provided with questionnaire packs which they gave to potential participants who attended the medical service, and who based on their medical records, met the inclusion criteria. The questionnaire packs contained: the preliminary question sheet (appendix C), the information sheet (appendix D), the questionnaire (appendix E), invitation to take part in interview sheet (appendix F) and 2 envelopes (a large brown one to return completed questionnaire and a small white one to return invitation to take part in interviews). Participants were given the following options:

- Self-administer questionnaire in the waiting room and return in sealed envelope to the researcher who was in the waiting room on weekdays.
- Researcher-administered questionnaire in any of the free consultation rooms.

Before the researcher administered questionnaires, she introduced herself, the aims of the study, verbally went through the information sheet, and obtained verbal consent. The act of following the researcher into a free consultation room and the verbal completion of the questionnaire was deemed as implied consent. The return of completed self-administered questionnaire to either the researcher or doctors was also deemed as implied consent.

For the final month of recruitment, due to unforeseen circumstances, the researcher was not on-site to administer questionnaires. Consequently, all questionnaires administered in the final month of recruitment were self-administered and returned to doctors in NNPC medical services who passed them on to the researcher.

University of Calabar Teaching Hospital (UCTH): Semi-urban site

Eligible participants were recruited from the Medical Outpatients Department (MOPD) and the Family Medicine department of the University of Calabar Teaching Hospital. Table 4.3 below presents the days of the week and clinics from which participants were recruited.

Day of the week	Clinics from which participants were recruited
Tuesday	Cardiac clinic MOPD
Wednesday	Diabetes clinic MOPD
Thursday	Family medicine
Friday	Family medicine

Table 4.3: Days of the week and clinics from which participants were recruited.

The researcher explained the eligibility criteria and provided 3 medical records staff from MOPD and family medicine with the eligibility criteria and the preliminary questions sheet (appendix C). Using the eligibility criteria and the preliminary question sheet, medical records staff went through patient files to identify potential participants. The MOPD clinics were pre-booked by patients, thus potential participants were identified the day before the clinic i.e. potential participants from the Tuesday cardiac clinic were identified on Monday.

Once potential participants arrived and were registered for their respective clinics, they were identified to the researcher by medical records staff. Family medicine is a walk-in service thus patients did not pre-book to attend. Consequently, potential participants were identified by medical record staff as they were being registered and were identified to the researcher once their registration was complete.

In both MOPD and family medicine, the researcher approached participants in the waiting room and introduced herself and the study. The researcher provided potential participants with the information sheet (appendix D) and verbally went through it with participants. Potential participants were given the information sheet and were left to decide if they wanted to take part in the study. Participants who verbally consented to take part in the study, were invited into a side office reserved for this study and the questionnaire was verbally administered by researcher. Once the questionnaire was completed, participants were thanked for taking part and were escorted back to the waiting room. The act of following the researcher out of the waiting room, into the room designated for the study and the verbal completion of the questionnaire was deemed as implied consent.

4.3.6 Data collection

A questionnaire was used to elicit diet and exercise behaviours; perceptions of high cholesterol; perceived future risk of cardiovascular diseases; and perceived availability of social support from participants in Nigeria (appendix E). A brief

description and rationale for the use of each questionnaire component will be presented below.

Measure of dietary consumption (Section 2 of questionnaire-Appendix E)

To describe and compare the dietary behaviour of statin users and non-statin users, questions pertaining to dietary fat consumption were adapted from the EPIC-Norfolk food frequency questionnaire (FFQ). The EPIC-Norfolk FFQ was developed to obtain detailed dietary information from a population of 40-79 year old residents of Norfolk and Norwich, in order to investigate the relationship between diet and the incidence of cancer, cardiovascular disease and diabetes for the Norfolk arm of the European Prospective Investigation of Cancer and Nutrition (EPIC) study (European Prospective Investigation of Cancer, 2014).

Questions from the EPIC-Norfolk FFQ were used in this study (questions 1-6 of section 2 of the questionnaire - Appendix E) because they are widely used, quantitative, tick-box questions that can be self-administered or research administered with minimal participant burden (Bingham et al., 2001, Gibney et al., 2004). Furthermore, they assess habitual diet which is pertinent to chronic illnesses such as high cholesterol that may develop from prolonged exposure to poor diets (Gibney et al., 2004).

Food frequency questionnaires need to reflect the dietary patterns of the population under study (Gibney et al., 2004), consequently for this study, the food items listed were changed to reflect a Nigerian diet. This was done based on knowledge of the researcher and suggestions from the pilot participants. These questions were piloted on a sample of 10 Nigerians aged 25-62 years and were adjusted accordingly based on feedback from pilot participants.

Measure of dietary behaviour change (Section 2 of questionnaire-Appendix E)

Prochaska and DiClemente's stage model of dietary change was used to assess reduction in dietary fat consumption (questions 7-8 of section 2 of the questionnaire-Appendix E). The questionnaire assessed participants' current stage of change: pre-contemplation, contemplation, decision, action and maintenance (Curry et al., 1992). Participants in the first 3 stages of change were regarded as non-adopters of a low-fat diet as they had not reportedly made any dietary changes. Participants in the action and maintenance stages were regarded as adopters of a low-fat diet as they had reportedly made dietary changes.

This model of behaviour change has been used in a Nigerian population to assess stages of change in relation to condom-use (Essien et al., 2005) and to categorize market vendors in Nigeria based on their physical activity level and was found to be effective (Maruf et al., 2014).

Measure of level of physical activity (Section 3 of questionnaire - Appendix E)

The General Practice Physical Activity Questionnaire (GPPAQ) was used to assess the physical activity level of study participants. The GPPAQ is a short, validated questionnaire commissioned by the UK Department of Health to assess the physical activity levels of adults aged 16-74 years in primary care. It classifies participants into 4 groups namely: inactive, moderately inactive, moderately active and active (Department of Health, 2013). This formed question 1 of section 3 of questionnaire (Appendix E).

Measure of exercise behaviour change (Section 3 of questionnaire - Appendix E)

As was done to assess measure of dietary behaviour change, Prochaska and DiClemente's stage model of dietary change was adapted and used to categorize participants as either adopters or non-adopters of healthy lifestyle choices (Curry et al., 1992). This formed questions 2-3 of the section 3 of the questionnaire (Appendix E).

Measure of adherence to statins (Section 4 of questionnaire - Appendix E)

An adapted version of the 4 item scale developed by Morisky *et al* to measure adherence to antihypertensive medications was used to assess adherence to statins (Morisky et al., 1986). This scale is simple, straightforward and was found to be reliable and valid (Morisky et al., 1986). This scale has also been used to assess medication adherence in a Nigerian population (Adelufosi et al., 2012, Adewuya et al., 2008). Participants who reported adherence of less than 80% (missed taking statin more than twice the previous week) were categorized as non-adherent (Cramer et al., 2007).

Perceptions of high cholesterol (Section 5 of questionnaire - Appendix E)

The revised illness perception questionnaire (IPQ-R) was used to assess the cognitive representations of and emotional responses to high cholesterol. The illness perception questionnaire (IPQ) was developed to provide a quantitative means of assessing the 5 cognitive constructs of the common sense model (Moss-

Morris et al., 2002, Weinman et al., 1996). It has been used in a variety of studies on a wide range of conditions including hypertension and diabetes (Barnes et al., 2004, Moss-Morris et al., 2002, Ross et al., 2004). It has also been used to assess adherence to medical regimens and attendance to cardiac rehabilitation. However, the IPQ has no measures to assess emotional representation thus the IPQ-R was developed (Moss-Morris et al., 2002). The IPQ-R has test-retest reliability similar to that of the IPQ and in addition to including an emotional component, it also improves on the reliability of the subscales of the IPQ (Moss-Morris et al., 2002). The IPQ and IPQR has been used in various African populations including South African populations, Ghanaian populations and Nigerian populations (Botha et al., 2002, Cooper et al., 1999, Moss-Morris et al., 2002, Otekeiwebia et al., 2015). Two items “spiritual causes” and “fate/destiny” were added to the cause subscale because religion plays a major role in the way Nigerians perceive the world around them and make sense of illness, death and suffering (Falola, 2001).

Perceptions of future risk of cardiovascular disease (Section 6 of questionnaire - Appendix E)

One of the major limitations of the health belief model is the inconsistency in the measurements of the 4 variables: most studies operationalize the variables differently (Janz and Becker, 1984). A scoping search was performed to identify health belief model instruments specific to cardiovascular disease. Only 2 studies were found, one of which performed a literature review and found no health belief model instruments specific to coronary heart disease. Thus the authors adapted health belief model instruments from other studies (Ali, 2002). The purpose of the second study was to design a Health Belief Related to Cardiovascular Disease Scale. The perceived benefits and susceptibility subscales were found to be valid, whilst the subscales for perceived severity and barriers lacked validity. Furthermore, this scale has never been used or tested in any other study (Tovar et al., 2010). Due to the lack of a reliable, valid and empirically supported health belief model instrument specific to cardiovascular disease, the Champion’s health belief model scale was used in this research. The scale was developed by Champion in 1984 specifically to predict the frequency of breast self-examinations (Champion, 1984) but has been adapted for use on a variety of health behaviours (Gochman, 1997). The health belief model has been widely used to investigate HIV risk perception in African countries including Nigeria.

Perceived availability of social support (Section 7 of questionnaire – Appendix E)

The Medical Outcome Study (MOS) Social Support Survey will be used to measure social support in this research. It is relatively short and was developed using patients who had 1 of the following 4 modifiable chronic illnesses: hypertension, diabetes, coronary heart disease and depression (Sherborne and Stewart, 1991). This survey measures the perceived availability of social support (Sherborne and Stewart, 1991) which research suggests is the dimension of social support that is most closely associated with health outcomes (Sarason et al., 1990). The MOS social support survey is made up of 2 items assessing structural support and 19 items measuring the following 5 dimensions of functional social support: emotional support; informational/cognitive support; tangible/instrumental support; positive social interaction and affection support (Sherborne and Stewart, 1991). When piloted on a Nigerian population, some of the items in the emotional support and tangible/instrumental support subscales were found to be culturally inappropriate and were removed or re-worded to investigate the same concept using culturally appropriate questions. The amended questionnaire was used in both countries. The details of the changes made to the MOS social support survey are presented in Table 4.4 below.

Original questionnaire	Amended questionnaire
Someone to have a good time with	Reworded to read
Someone to get together with for relaxation	Someone to spend time with
Someone to spend time with	
Someone who shows you love and affection	Removed
Someone who hugs you	
Someone whose advice you really want	
Someone to share your most private worries and fears with	
Someone to love and make you feel wanted	

Table 4.4: Amendments made to the social support component of study questionnaire

4.3.7 Data analysis

Data from administered questionnaires was entered into the Statistical Package for the Social Sciences (SPSS) by the researcher. Participants who reported being in the pre-contemplation, contemplation or decision stages were classified as non-adopters of a low-fat diet or healthy exercise behaviours because at the time of the study they were not reportedly reducing their fat intake or increasing the frequency or intensity of their exercise. Participants who reported being in the action or maintenance stages, were classified as adopters of a low-fat or healthy exercise

behaviours because at the time of the study, they were reportedly decreasing the amount of fat in their diet or increasing the frequency or intensity of their exercise.

Reverse scoring was taken into account during data entry of the subscales of the IPQ-R (Moss-Morris et al., 2002). The total score was calculated for all subscales of the IPQ-R except the cause subscale, Champion's health belief model scale and MOS social support survey. The total score for each of the subscales in these scales were divided by the total number of items in each subscale to produce a mean subscale score. In accordance with the instructions for the IPQ-R, the cause subscales were not treated as scales, thus the total scores of each of the cause subscales were calculated and were presented in the results tables (Champion, 1984, Moss-Morris et al., 2002, Pallant, 2010, Sherborne and Stewart, 1991).

Descriptive analysis

For each continuous variable (see Table 4.5), normality of the data was assessed and a summary statistic e.g. mean/median and a measure of spread e.g. standard deviation was calculated and presented. The frequencies of the categorical variables presented in Table 4.5 were also calculated and presented.

Continuous variables	Categorical variables
Age	Statin-status
Causal perceptions of high cholesterol	Age categories
	Gender
	Ethnicity
	Education level
	Marital status
	Lived outside of Nigeria in the 10-years prior to the study
	Hypertension
	Diabetes
	Hypertension and diabetes
	Research site
	Dietary behaviours
	Exercise behaviours
	Perceptions of high cholesterol
	Perceptions of future risk of CVD

Table 4.5: Table of continuous and categorical data.

Univariate analysis

Independent t-tests and X^2 tests were used to assess the between group differences (statin users vs. non-statin users) in the variables presented in Table 4.5 (Field, 2009). Mann-Whitney tests were used to assess between group differences in continuous variables that were not normally distributed. Fisher's exact tests were

used to assess between group differences for categorical variables where the expected frequency in any category was less than 5.

Multivariate analysis

Variables that demonstrated significant between group differences from univariate analysis were entered into logistic regression models to examine whether they would be significantly associated with the adoption of low-fat diet or the adoption of healthy exercise behaviours.

4.3.8 Ethical considerations

Informed consent

Questionnaires: To ensure participants made an informed decision about their participation in this study, they were provided with a clear and concise information sheet detailing: the purpose of this research; what participation entailed; the freedom to withdraw; and the process of withdrawal (see appendix D).

Nigeria has a cultural emphasis of oral communication, thus written consent was not requested as it may have been viewed as formal and impersonal and could have deterred individuals from taking part in this study. Consequently, the act of following the researcher into a free consultation room or a room designated for this study, and the verbal completion of the questionnaire was deemed as implied consent. The return of completed self-administered questionnaires to either the researcher or doctors in the urban site was also deemed as implied consent.

Confidentiality and anonymity

The information sheet (appendix D) was used to inform participants that all data would be confidential and used solely for the purpose of this research. Data was anonymised to protect the identity of participants. Signed consent forms and any other identifiable data were kept separately from filled questionnaires.

Participant burdens

The questionnaire was kept as short as possible to reduce the burden on participants and all questions with the exception of 2 were tick boxes. The questionnaire was piloted with individuals from a Nigerian population and certain questions particularly questions pertaining to the emotional and practical aspects of social support were reworded to investigate the same concept using culturally appropriate questions.

Data protection

All computerised data was password protected and all hard copies of data such as filled questionnaires were safely stored in a locked cabinet whilst in Nigeria and in filing cabinets in Leeds Institute of Health Science whilst in the UK.

Ethical approval

This study received ethical approval from: Nigerian Institute of Medical Research (appendix H); Nigerian National Petroleum Corporation (NNPC) Medical Services (appendix I); University of Calabar Teaching Hospital (UCTH) (appendix J); and Leeds Institute of Health Sciences and Leeds Institute of Genetics, Health and Therapeutic and Leeds Institute of Molecular Medicine (LIHS/LIGHT/LIMM) joint ethics committee (appendix K).

4.4 Results

This results section begins with a description of participant demographics and cardiovascular disease risk factors. This will be followed by data on dietary and exercise behaviours; perceptions of high cholesterol; and perceptions of future cardiovascular disease risk. This results section will conclude with the findings from the logistic regression models used to identify factors that were associated with the adoption of a low-fat diet and healthy exercise behaviours in the study sample. Data will be presented for the sample population as a whole and then will be presented based on the following 3 categories: statin-status (statin users vs non-statin users) this is the main comparison of interest; gender (males vs females); and research site (semi-urban dwellers vs urban dwellers).

A total of 148 questionnaires were administered. All participants that were approached were successfully recruited into the study thus the response rate was 100%. The number of participants that completed each section of the questionnaire are presented in Figure 4.2 below. Majority of participants did not complete the social support section of the questionnaire, thus no social support findings will be presented in this study. A total of 128 participants completed all sections of the questionnaire that were entered into the logistic regression model for adoption of a low-fat diet.

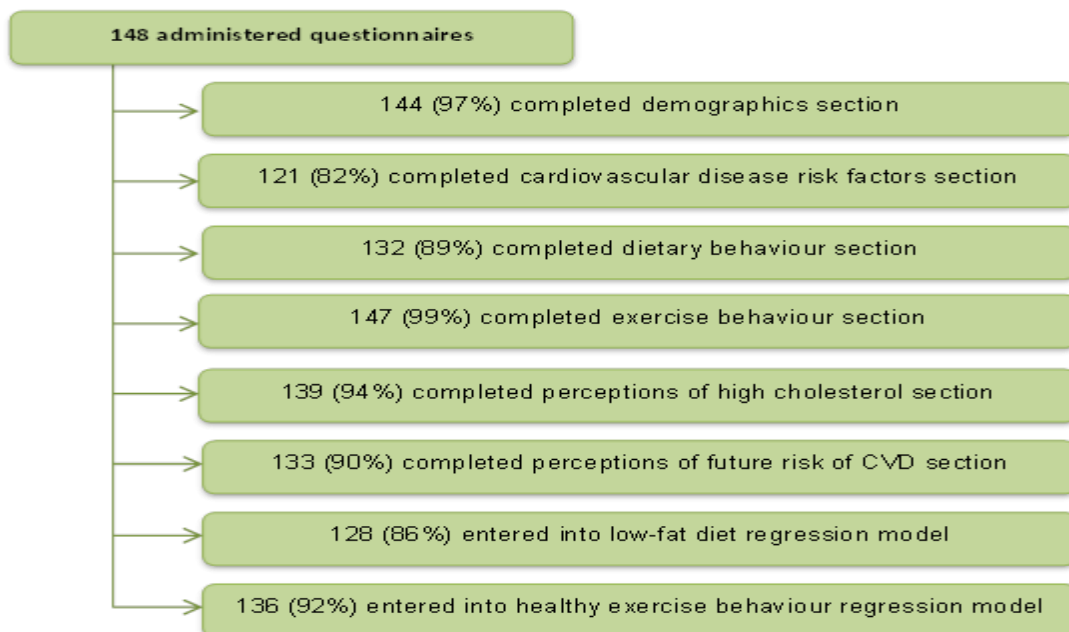


Figure 4.2: Schematic diagram showing the number of participants that completed each section of the questionnaire in the Nigeria sample.

4.4.1 Characteristics of the study sample

The demographics section of 144 (97%) and the cardiovascular disease risk factor section of 121 (82%) of the 148 administered questionnaires were completed. The overall sample consisted of 78 (53%) statin users and 70 (47%) non-statin users, over half (55%) of participants were recruited from the semi-urban site, while 66 (45%) were recruited from the urban site. As shown in Table 4.6, participants were predominantly females (57%), aged between 40-69 years (84%) and the mean age of the sample was 52.9 years (SD=11.11). Most participants had hypertension (60%) and a quarter (24%) had hypertension and diabetes.

Statin and non-statin users significantly differed in marital status: 4% of statin users were widowed compared to 13% of non-statin users (Fisher's exact=7.52, $p=0.05$). Although not statistically significant, more statin users were recruited from the urban site than non-statin users (50% vs 39%, $X^2=1.950$, $p=0.187$).

Males and females significantly differed in site of recruitment: Females were 4 times more likely to have been recruited from the semi-urban site than males (68% vs 32%, $X^2=12.19$, $p=0.001$), they were also less educated (39% tertiary education vs 75% of males, Fisher's exact= 21.64, $p<0.001$) and were significantly more likely to be widowed than males (13% vs 0% Fisher's exact= 11.75, $p=0.007$). Although not statistically significant, more males had hypertension than females (67% males vs 54%, females, $X^2=2.497$, $p=0.114$).

Semi-urban dwellers and urban dwellers significantly differed in their prevalence of diabetes: semi-urban dwellers were 3 times more likely to have diabetes (40% vs 32%, $X^2=6.79$, $p=0.011$) than urban dwellers, they were also significantly less educated (38% tertiary education vs 76%, Fisher's exact= 41.14, $p<0.001$), 8 times less likely to have lived outside Nigeria in the 10-years prior to the study (4% vs 23%, $X^2=12.72$, $p<0.001$) and were significantly less likely to be married in comparison to urban dwellers (74% married vs 82%, Fisher's exact= 8.63, $p=0.031$).

Variable	Statin users n=78 (52.7%)	Non-statin users n= 70 (47.3%)	Overall n=148 (100%)
Mean age (years) (SD)	52.68 (10.45)	53.16 (11.88)	52.91 (11.11)
20-29	0 (0)	2 (2.9)	2 (1.4)
30-39	9 (11.5)	4 (5.7)	13 (8.8)
40-49	21 (26.9)	20 (28.6)	41 (27.7)
50-59	27 (34.6)	25 (35.7)	52 (35.1)
60-69	19 (24.4)	13 (18.6)	32 (21.6)
70-79	1 (1.3)	4 (5.7)	5 (3.4)
80-89	1 (1.3)	2 (1.4)	3 (2.0)
Gender			
Male	35 (44.9)	29 (41.4)	64 (43.2)
Female	43 (55.1)	41 (58.6)	84 (56.8)
Ethnicity			
Cross Rivers	35 (44.9)	42 (60.0)	77 (52.0)*
Hausa and Fulani	8 (10.3)	0 (0)	8 (5.4)*
Igbo	12 (15.4)	11 (15.7)	23 (15.5)*
Ijaw	6 (7.7)	2 (2.9)	8 (5.4)*
Yoruba	10 (12.8)	5 (7.1)	15 (10.1)*
Other	6 (7.7)	9 (12.9)	15 (10.1)*
Unknown	1 (1.3)	1 (1.4)	2 (1.4)
Education			
Primary or less	21 (26.9)	26 (37.1)	47 (31.8)
Secondary level	11 (14.1)	5 (7.1)	16 (10.8)
Tertiary level	44 (56.4)	37 (52.9)	81 (54.7)
Unknown	2 (2.6)	2 (2.9)	4 (2.7)
Marital status			
Single	6 (7.7)	6 (8.6)	12 (8.1)*
Married	62 (79.5)	53 (75.7)	115 (77.7)*
Separated/ divorced	7 (9.0)	1 (1.4)	8 (5.4)*
Widowed	3 (3.8)	9 (12.9)	12 (8.1)*
Unknown	0 (0)	1 (1.4)	1 (0.7)
Lived outside Nigeria in past 10 years			
Yes	11 (14.1)	7 (10.0)	18 (12.2)
No	67 (85.9)	62 (88.6)	129 (87.2)
Unknown	0 (0)	1 (1.4)	1 (0.7)
Hypertension			
Yes	49 (62.8)	39 (55.7)	88 (59.5)
No	18 (23.1)	18 (25.7)	36 (24.3)
Unknown	11 (14.1)	13 (18.6)	24 (16.2)
Diabetes			
Yes	31 (39.7)	23 (32.9)	54 (36.5)
No	35 (44.9)	32 (45.7)	67 (45.3)
Unknown	12 (15.4)	15 (21.4)	27 (18.2)
Hypertension and diabetes			
Yes	19 (24.4)	17 (24.3)	36 (24.3)
No	47 (60.3)	38 (54.3)	85 (57.4)
Unknown	12 (15.4)	15 (21.4)	27 (18.2)
Research site			
Semi-urban	39 (50.0)	43 (61.4)	82 (55.4)
Urban	39 (50.0)	27 (38.6)	66 (44.6)

Table 4.6: Characteristics of the Nigeria sample.

*p<0.05

4.4.2 Dietary behaviours

The dietary behaviours section of 132 (89%) of the 148 administered questionnaires were completed. As shown in Table 4.7, most participants (76%) reported consuming fried foods at home on a weekly basis, while only 35% reported doing so away from their homes. Three quarters of participants had reportedly decreased the amount of fat in their diet at some point in their lives and 69% reported that they were still doing so at the time of the study i.e. had adopted a low-fat diet. Over half of these adopters (59%) had reportedly been limiting the amount of fat in their diet for a least a year prior to the study. Only 7% of non-adopters reportedly considered limiting the amount of fat in their diet in the month prior to the study.

Statin and non-statin users did not significantly differ in their reported adoption of a low-fat diet or any other reported dietary behaviours. However, more statin users reported adopting a low-fat diet than non-statin users (73% vs 64%, $X^2=1.638$, $p=0.201$) and more statin users reportedly thought they were eating a low-fat diet at the time of the study than non-statin users (65% vs 54%, $X^2=1.358$, $p=0.244$).

Males and females did not significantly differ in their reported adoption of a low-fat diet: however, more males reportedly adopted a low-fat diet than females (75% vs 64%, $X^2=2.402$, $p=0.121$). Interestingly, although more males reported eating fried foods on a weekly basis (83% vs 71%, $X^2=2.251$, $p=0.134$) and significantly more males reported eating fried food away from the home than females (47% vs 26%, Fisher's exact=8.401, $p=0.007$), males were 2 times more likely to reportedly think they were eating a low-fat diet than females (67% vs 55%, $X^2= 3.88$, $p=0.049$).

Semi-urban dwellers and urban dwellers significantly differed in the adoption of a low-fat diet: semi-urban dwellers were 6 times less likely to report the adoption of a low-fat diet than urban dwellers (55% vs 86%, $X^2= 18.30$, $p<0.001$). Surprisingly, despite being 7 times less likely to report consuming fried foods on a weekly basis (65% vs 91%, $X^2=15.61$, $p<0.001$), and 16 times less likely to report consuming fried foods outside the home (11% vs 65%, Fisher's exact=51.41, $p<0.001$), semi-urban dwellers were 8 times less likely to reportedly think they were eating a low-fat diet than urban dwellers (44% vs 80%, $X^2=21.90$, $p<0.001$).

Variable	Statin users n=78 (52.7%)	Non-statin users n= 70 (47.3%)	Overall n=148 (100)
Fried food consumption			
Consume fried foods on a weekly basis at home			
Yes	59 (75.6)	54 (77.1)	113 (76.4)
No	18 (23.1)	16 (22.9)	34 (23.0)
Unknown	1 (1.3)	0 (0)	1(0.7)
Consume fried foods on a weekly basis away from home			
Yes	30 (38.5)	22 (31.4)	52 (35.1)
No	48 (61.5)	47 (67.1)	95 (64.2)
Unknown	0 (0)	1 (1.4)	1(0.7)
Think they are currently eating a low fat diet			
Yes	51 (65.4)	38 (54.3)	89 (60.1)
No	20 (28.2)	23 (32.9)	43 (29.1)
Unknown	7 (9.0)	9 (12.9)	16 (10.8)
Ever decreased fat in diet			
Yes	62 (79.5)	53 (75.7)	115 (77.7)
No	16 (20.5)	17 (24.3)	33 (22.3)
Currently decreasing fat in diet			
Yes (Adopters)	57 (73.1)	45 (64.3)	102 (68.9)
No (Non-adopters)	20 (25.6)	25 (35.7)	45 (30.4)
Unknown	1 (1.3)	0 (0)	1 (0.7)
Adopters only			
Duration of decreasing fat in diet			
<30 days	4 (7.0)	3 (6.7)	7 (6.9)
1-6 months	12 (21.1)	11 (24.4)	23 (22.5)
7-12 months	7 (12.3)	2 (4.4)	9 (8.8)
>1 year	32 (56.1)	28 (62.2)	60 (58.8)
Unknown	2 (3.5)	1 (2.2)	3(2.9)
Non-Adopters only			
Thought about reducing the amount of dietary fat in the past month			
Yes	0 (0)	3 (12.0)	3 (6.7)
No	19 (95.0)	17 (68.0)	36 (80.0)
Unknown	1 (5.0)	5 (20.0)	6 (13.3)

Table 4.7: Dietary behaviours of the Nigeria study sample.

4.4.3 Exercise behaviours

The exercise behaviours section of 147 (99%) of the 148 administered questionnaires were completed. Majority of the study sample (80%) were classified as inactive/moderately inactive and reported that they had never increased the frequency or intensity of their exercise (78%). As shown in Table 4.8, majority of participants (84%) had reportedly not adopted healthy exercise behaviours, 76% of these non-adopters claimed they had not considered adopting healthy exercise behaviours in the month prior to the study.

Statin users were significantly less active than non-statin users, 86% of statin users were inactive/moderately inactive compared to 74% of non-statin users ($X^2= 3.852$, $p=0.05$).

Males and females did not significantly differ in reported adoption of healthy exercise behaviours or in any other reported exercise behaviours. However, more males reportedly adopted healthy exercise behaviours than females (22% vs 12%, $X^2=2.658$, $p=0.103$), and claimed to have done so for over a year (50% vs 20%, Fisher's exact=4.430, $p=0.171$). Furthermore, of those who had not adopted healthy exercise behaviours, more males reportedly considered adopting healthy exercise behaviours in the month prior to the study than females (32% vs 18%, $X^2=3.317$, $p=0.069$).

Semi-urban and urban dwellers did not significantly differ in reported adoption of healthy exercise behaviours: however, less semi-urban dwellers reportedly adopted healthy exercise behaviours than urban dwellers (12% vs 21%, $X^2=2.188$, $p=0.139$). Furthermore, semi-urban dwellers were 3 times less likely to claim they had ever increased their frequency or intensity of exercise (15% vs 30%, $X^2= 5.30$, $p=0.027$); and were 15 times less likely to reportedly consider adopting healthy exercise behaviours in the month prior to the study than urban dwellers (6% vs 48%, $X^2= 30.00$, $p<0.001$).

Variable	Statin users n=78 (52.7%)	Non-statin users n=70 (47.3%)	Overall n=148 (100%)
Physical activity level			
Inactive/moderately inactive	67 (85.9)	52 (74.3)	119 (80.4)*
Moderately active/active	10 (12.8)	18 (25.7)	28 (18.9)
Unknown	1 (1.3)	0 (0)	1 (0.7)
Ever increased frequency/intensity of exercise			
Yes	18 (23.1)	14 (20.0)	32 (21.6)
No	60 (76.9)	56 (80.0)	116 (78.4)
Currently doing more exercise			
Yes (adopters)	13 (16.7)	11 (15.7)	24 (16.2)
No (non-adopters)	65 (83.3)	59 (84.3)	124 (83.8)
Adopters only			
Duration of increasing frequency/intensity of exercise			
<30 days	6 (46.2)	1 (9.1)	7(29.2)
1-6 months	3 (23.1)	4 (36.4)	7 (29.2)
7-12 months	0 (0)	1 (9.1)	1 (4.2)
>1 year	4 (30.8)	5 (45.5)	9 (37.5)
Non-adopters only			
Thought about increasing frequency or intensity of exercise in the past month			
Yes	13 (20.0)	16 (27.1)	29 (23.4)
No	52 (80.0)	40 (71.2)	94 (75.8)
Unknown	0 (0)	1 (1.7)	1 (0.8)

Table 4.8: Exercise behaviours of the Nigeria study sample.

* $p\leq 0.05$

4.4.4 Perceptions of high cholesterol

The perceptions of high cholesterol section of 139 (94%) of the 148 administered questionnaires were completed. As shown in Table 4.9, the highest scores obtained from the overall sample were for reported perceptions of personal control of high cholesterol (mean score=3.9, SD=0.62) followed by reported perceptions of statin control of high cholesterol (mean score=3.7, SD=0.64). This indicates that participants reportedly believed their high cholesterol could be controlled by their own behaviours and by taking a statin, though reported perceptions of the former were stronger than perceptions of the latter. Correspondingly, the most important cause of high cholesterol reported by participants was lifestyle causes followed by biomedical causes. The lowest score obtained was for reported timeline acute/chronic beliefs (mean score=2.2, SD=0.66) and perceived consequences (mean score=2.94, SD=0.66) of high cholesterol. This indicates that participants reportedly perceived their high cholesterol as acute rather than chronic and did not believe that the consequences of high cholesterol were serious.

Statin and non-statin users reported stronger perceptions of personal control than statin control of high cholesterol. This indicates that both groups reportedly believed that their behaviours could control their high cholesterol better than statin-use. However, statin users reported significantly stronger statin control perceptions than non-statin users (3.8 vs 3.6, $U=1721.500$, $p=0.003$). Although not statistically significant, statin users also reported stronger perceptions that high cholesterol was acute (2.1 vs 2.3, $U=2204.500$, $p=0.374$) and reported stronger spiritual cause perceptions than non-statin users (7.1 vs 6.6, $U=2224.500$, $p=0.449$).

Males and females significantly differed in their reported illness coherence perceptions: males reported significantly stronger illness coherence perceptions than females (3.6 vs 2.9, $U=1624.000$, $p=0.001$). This indicates that males reportedly believed they had a good understanding of high cholesterol. Thus, it is not surprising that males reported significantly weaker spiritual cause perceptions (6.0 vs 7.4, $U=1681.500$, $p=0.004$) and cyclical timeline beliefs than females (2.9 vs 3.3, $U=1736.500$, $p=0.008$).

Semi-urban dwellers and urban dwellers significantly differed in reported illness coherence perceptions: semi-urban dwellers reported significantly lower illness coherence perceptions (2.9 vs 3.6, $U=1497.000$, $p<0.001$) than urban dwellers. Contrastingly, they reported significantly stronger perceptions of chronicity (2.4 vs

2.0, $U=1587.500$, $p<0.001$), but also reported stronger perceptions that high cholesterol varied with time than urban dwellers (3.4 vs 2.9, $U=1626.500$, $p=0.002$).

Variables	Statin users n=75 (SD)	Non-statin users n=64 (SD)	Overall n=139 (SD)
Mean perceived timeline acute/chronic	2.12 (0.67)	2.31 (0.70)	2.21 (0.66)
Mean perceived timeline cyclical	3.16 (0.84)	3.18 (0.85)	3.17 (0.84)
Mean perceived consequences	2.94 (0.68)	2.94 (0.65)	2.94 (0.66)
Mean perceived personal control	3.87 (0.68)	3.84 (0.58)	3.85 (0.62)
Mean perceived statin control	3.78 (0.66)	3.57 (0.59)	3.68 (0.64) **
Mean perceived emotional response	2.95 (0.95)	3.03 (0.93)	2.99 (0.94)
Mean perceived illness coherence	3.24 (1.13)	3.19 (1.13)	3.22 (1.12)
Total perceived biomedical cause [£]	13.99 (2.90)	14.06 (3.91)	14.02 (3.39)
Total perceived spiritual cause [€]	7.08 (3.37)	6.55 (2.98)	6.83 (3.20)
Total perceived lifestyle cause ^{\$}	23.51 (4.35)	23.97 (4.86)	23.72 (4.58)

Table 4.9: Perceptions of high cholesterol in the Nigeria sample.

** $p<0.01$, £ this sub-scale has 5 items and scores range between 5-25, € this subscale has 3 items and scores range between 3-15, \$ this subscale has 8 items and scores range between 8-40.

4.4.5 Perceptions of future risk of cardiovascular disease

The perceptions of future risk of cardiovascular disease of 133 (90%) of the 148 administered questionnaires were completed. As shown in Table 4.10, the highest scores obtained from the overall sample were perceived benefits of healthy lifestyle choices (4.00 SD=0.65) followed by perceived benefits of statin-use (3.8 SD=0.70). This indicates that participants reportedly perceived healthy lifestyle choices to be more beneficial than statin-use for the prevention of cardiovascular disease. This mirrors the findings that participants reportedly believed that their high cholesterol could be better controlled by their own behaviours than by statin-use. Despite being reportedly perceived as more beneficial for cardiovascular disease prevention, healthy lifestyle choices were reportedly considered to have more barriers than statin-use. The lowest score obtained was for reported perceived susceptibility (2.4, SD=0.83). This indicates that participants did not reportedly believe that they were at risk of cardiovascular disease.

Statin and non-statin users significantly differed in their reported perceived barriers to statin-use for cardiovascular disease prevention: statin users reportedly perceived significantly fewer barriers to statin-use than non-statin users (2.3 vs 2.6, $U=1715.000$, $p=0.027$). Statin users also reportedly perceived cardiovascular disease to be more severe (3.1 vs 2.9, $U=1745.500$, $p=0.040$) and claimed they felt

more susceptibility to cardiovascular disease (2.4 vs 2.3, U=1954.000, p=0.253) than non-statin users. The latter however was not statistically significant.

Males and females did not significantly differ in their perceptions of future risk of cardiovascular disease. However, males reportedly perceive themselves to be more susceptible to cardiovascular disease than females (2.2 vs 2.5, U=1928.5, p=0.268). Males also reportedly perceived more benefits of (4.1 vs 3.9, U=1806.000, p=0.082) and fewer barriers to (2.6 vs 2.8, U=1887.500, p=0.204) the adoption of healthy lifestyle choices for the prevention of cardiovascular disease than females.

Semi-urban and urban dwellers significantly differed in their reported perceived benefits of and barriers to healthy lifestyle choices: semi-urban dwellers reportedly perceived significantly less benefits of (3.9 vs 4.1, U=1635.500, p=0.007) and more barriers to (2.8 vs 2.0, U=1815.000, p=0.840) the adoption of healthy lifestyle for cardiovascular disease prevention. The latter however was not statistically significant. Finally, semi-urban dwellers reported significantly weaker perceptions of the severity of cardiovascular diseases than urban dwellers (2.8 vs 3.2, U=1707.500, p=0.027).

Variable	Statin users n=71 (SD)	Non-statin users n=62 (SD)	Overall n=133 (SD)
Perceived susceptibility	2.44 (0.84)	2.25 (0.80)	2.35 (0.83)
Perceived severity	3.10 (0.68)	2.86 (0.75)	2.99 (0.72)*
Perceived benefits of statins	3.88 (0.67)	3.72 (0.73)	3.80 (0.70)
Perceived benefits of healthy lifestyle choices	4.00 (0.65)	4.01 (0.66)	4.00 (0.65)
Perceived barriers to statins	2.31 (0.72)	2.56 (0.79)	2.43 (0.76)*
Perceived barriers to healthy lifestyle choices	2.76 (0.76)	2.69 (0.74)	2.73 (0.75)

Table 4.10: Perceptions of future risk of cardiovascular disease in the Nigeria sample.

* p≤0.05

4.4.6 Factors associated with the adoption of a low-fat diet

Of the 148 participants recruited, 128 (86%) completed all sections of the questionnaire that were entered into a logistic regression model. A logistic regression was performed to assess which of the following 7 reported variables were associated with the adoption of a low-fat diet: statin-status; gender; research site; physical activity level; perceived statin control of high cholesterol; perceived barriers to statin-use for cardiovascular disease prevention; and perceived severity of cardiovascular disease.

The logistic regression model was statistically significant ($X^2= 25.822$, $p=0.001$) and correctly classified 73% of cases. The model explained between 18.3% (Cox and Snell R^2) and 26.0% (Nagelkerke R^2) of variance in the adoption of a low-fat diet and the Hosmer and Lemeshow test of fit indicated that the model was a good fit to the data ($X^2= 6.00$, $p=0.647$). As shown in Table 4.11, 2 variables made statistically significant contributions to the model namely: research site and perceived statin control of high cholesterol.

The odds of adopting a low-fat diet was 5 times less likely in participants recruited from the semi-urban research site. One of the variables that contribute significantly to the regression model was a perception about statin-use, namely: perceived statin control of high cholesterol. The odds of adopting a low-fat diet increased as reported perceived statin control of high cholesterol increased.

Variables	B	S.E	Wald	P value	OR	95%CI
Statin status (statin-use)	-0.20	0.46	0.20	0.66	0.82	0.34-1.96
Gender (Male)	0.45	0.48	0.87	0.35	1.56	0.61-4.00
Research site(semi-urban)	-1.51	0.52	8.90	0.003**	0.21 [§]	0.08-0.59 [§]
Physical activity level (inactive/moderately inactive)	-0.20	0.60	0.11	0.74	0.82	0.25-2.66
Statin control of high cholesterol	0.85	0.36	5.60	0.018**	2.33	1.16-4.69
Barriers to statins-use to prevent CVD	-0.33	0.30	1.24	0.27	0.72	0.40-1.29
Perceived severity of CVD	0.41	0.38	1.19	0.28	0.28	0.72-3.16

Table 4.11: Logistic regression model for adoption of a low-fat diet in the Nigeria sample.

* $p \leq 0.05$, ** $p \leq 0.01$, § Inverted version of these values i.e. 1 divided by the value is presented in the text to make interpretation easier (Pallant, 2010).

4.4.7 Factors associated with the adoption of healthy exercise choices

Of the 148 participants recruited, 136 (92%) completed all sections of the questionnaire that were entered into a logistic regression model. A logistic regression was performed to assess which of the following 9 reported variables were associated with the adoption of healthy exercise behaviours: statin-status; gender; research site; perceived personal control of high cholesterol; perceived statin control of high cholesterol; perceived benefits of statin-use for cardiovascular disease prevention; perceived benefits of adopting healthy lifestyle choices for cardiovascular disease prevention; perceived barriers to statin-use for cardiovascular disease prevention; and perceived barriers to adopting healthy lifestyle choices for the prevention of cardiovascular disease.

The model was not statistically significant ($X^2=9.674$, $p=0.378$). It correctly classified 83.1% of cases without any variables and correctly classified 83.1% of cases with the study variables. Consequently, the model was found to be a poor fit for the data and will not be presented.

In summary, the study sample consisted of 148 participants mainly aged between 40-69 years (84%), who were female (57%), semi-urban dwellers (55%), who had hypertension (60%) and were statin users (53%). Majority (69%) of the sample reported that they had adopted a low-fat yet only 16% reportedly adopted healthy exercise behaviours and 80% of participants were classified as inactive/moderately inactive.

Significantly more statin users were classified as inactive/moderately inactive than non-statin-users, but more of the former reportedly adopted a low-fat diet than the latter. More males reportedly adopted a low-fat diet and healthy exercise behaviours than females, yet, significantly more males reportedly consumed fried foods away from home on a weekly basis. On the other-hand, semi-urban dwellers were less likely to have reportedly adopted a low-fat diet and healthy exercise behaviours but were also less likely to report the consumption of fried foods on a weekly basis.

Participants reportedly perceived their high cholesterol to be controllable, acute and caused mainly by lifestyle factors. Although both statin users and non-statin users reportedly believed their behaviours could control their high cholesterol better than statin-use, statin users reported significantly stronger statin control perceptions than non-statin users.

Participants reportedly considered healthy lifestyle choices to be more beneficial than statin-use for the prevention of cardiovascular disease. Yet they claimed there were more barriers to the adoption of healthy lifestyle choices than to statin-use. Unsurprisingly, statin users reportedly perceived significantly fewer barriers to statin-use than non-statin users. They also reportedly perceived cardiovascular disease to be more severe and reportedly felt more susceptible to cardiovascular disease than non-statin users. However, the latter was not statistically significant. Male participants reportedly perceived fewer barriers to and more benefits of the adoption of healthy lifestyle choices than female participants. Finally, the adoption of low-fat diet was associated with: recruitment from the urban site and perceptions that statin use could control high cholesterol.

Chapter 5 : The UK quantitative study (Study 2)

5.1 Chapter overview

This chapter will begin by stating the aims and objectives of the UK quantitative study. This will be followed by a description of the research methods employed to fulfil these aims. The findings of this study will be described in this chapter but will be discussed in chapter 7 alongside a discussion of the findings of the Nigeria quantitative study and the qualitative study conducted with participants recruited from both countries. The limitations of this study will also be presented in chapter 7 alongside the limitations of the other studies conducted as part of this research.

5.2 Study aims

The study aimed to examine whether statin-use associates the adoption of healthy dietary and exercise choices by changing the way a UK population think of high cholesterol as a risk factor for cardiovascular disease. To fulfil this aim, the following research questions were investigated:

- 1) Is there a difference in the dietary and exercise behaviours of people at risk of cardiovascular disease who are (i) currently taking a statin (statin users) and (ii) not currently taking a statin (non-statin users)?
- 2) Is there a difference in the following illness perceptions of statin users and non-statin users?
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
- 3) Which of the following variables are significantly associated with the adoption of a low-fat diet and the adoption of healthy exercise behaviours?
 - Statin-use
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
 - Perceived availability of social support

5.3 Methods

In the section below, the study design and setting will be presented. The details of the inclusion and exclusion criteria; minimum sample size calculation; and participant recruitment strategies will also be presented. This section concludes

with a description of the data collection and analysis techniques employed to answer the research questions and fulfil the research aims.

5.3.1 Study design

A cross-sectional study design was used to obtain quantitative descriptions of the dietary and exercise behaviours; perceptions of high cholesterol; perceptions of future risk of cardiovascular disease; and perceived availability of social support from a UK sample at a single point in time using a questionnaire (Bryman, 2008). The details of the questionnaire will be presented under the data collection subsection 5.3.4.

5.3.2 Study setting

The United Kingdom (England, Wales, Scotland and Northern Ireland) is home to about 65-million people (Office for National Statistics, 2015). South Yorkshire was chosen as the UK site for this research. South Yorkshire is located in the Yorkshire and Humber region of England, and consist of 4 cities, namely: Barnsley, Doncaster, Rotherham and Sheffield. Deprivation in the Yorkshire and Humber region is higher than average deprivation in England, the same can be said of prevalence of hypertension, overweight/obesity, diabetes, physical inactivity, and prevalence of heart attacks and strokes (Public Health England, 2013, Public Health England, 2014).

5.3.3 Study participants

This study used participants from the South Yorkshire Cohort (SYC). The SYC is a research project that aims to follow 20,000 adults who live in South Yorkshire over a 10-year period in order to provide up-to-date information on the health of this population and to provide an avenue for research. At the time of the study, the SYC was comprised of 18,825 participants (CLAHRC for South Yorkshire, 2013).

To have been considered as eligible for inclusion in this study, participants must have diagnosed high cholesterol and must not have experienced a diagnosed cardiovascular disease event. Individuals who had experience a diagnosed cardiovascular event were excluded because this study aimed to focus on primary prevention. Individuals diagnosed with familial hypercholesterolemia and type I diabetes were excluded from this study due to the significant role of genetics in these conditions. Individuals diagnosed with hypertension, type II diabetes and obesity were included in this study as these conditions are more amenable to

behavioural factors such as diet and physical activity (British Nutrition Foundation, 2005, World Health Organisation et al., 2011). Due to the nature of this research, individuals with communication and cognitive difficulties were not included in this study. Table 5.1 details the main inclusion and exclusion criteria for this study.

Only White British and Irish individuals were included in this study because research evidence suggests that members of non-Western communities who settle or grow up in Western communities will undergo acculturation and acquire cultural beliefs and attributes of their host country. Evidence also suggests that acculturation may occur to various degrees and in some cases may not occur at all. Thus to control for this and to ensure that individuals from non-Western population (Nigerian population) were compared with individuals from a Western population (South Yorkshire population), this study only included individuals of White British and Irish origin.

This study aimed to recruit individuals with a 10-year cardiovascular disease risk of at least 10%. Participants above the age of 50-years who reported having hypertension, type II diabetes and were overweight were recruited.

Inclusion criteria	Exclusion criteria
✓ Diagnosed high cholesterol	x Diagnosed cardiovascular event
✓ White British/Irish background	x Diagnosed familial hypercholesterolemia
✓ ≥50 years	x Diagnosed type 1 diabetes
✓ hypertension	x Communication/cognitive difficulties
✓ type II diabetes	x Diagnosed conditions that could lead to secondary hypercholesterolemia
✓ BMI ≥25kg/m ²	(such as liver disease, kidney disease, hypothyroidism)

Table 5.1: Inclusion and exclusion criteria for the UK quantitative study

5.3.4 Minimum sample size

The minimum sample size required for this study was calculated using the premise that 15 participants were required for each predictor variable included in the regression model (Pallant, 2010). Thus the minimum sample size required to enter a minimum of 5 variables was 75 participants. An increase in number of recruited participants would have been matched with an increase in the number of variables entered into the regression model using the premise of 15 participants per variable as shown in Table 5.2 below. To allow for a response rate of 30% and due to funding restrictions, 250 questionnaires were sent to potential participants (Bryman, 2008).

Number of participants	Sample size
5	75
7	105
9	135

Table 5.2: Sample size calculation for regression model.

5.3.5 Recruitment procedure

This study was conducted between November 2014 and January 2015. Participants in the SYC had received and filled a SYC health questionnaire (appendix L) which contained questions about their demographics and health. They had also consented to have the information they provided used for research and had consented to be contacted to take part in further research (please find consent form on the last page of the SYC health questionnaire- appendix L). One of the organisers of the SYC identified potential participants who met the study inclusion criteria based on the information participants provided in the SYC health questionnaire. The identified organiser of the SYC was provided with an envelope containing the following which they addressed and posted to potential participants:

- Information sheet (appendix M)
- Questionnaire (appendix N)
- Invitation to take part in interviews (appendix O)
- Interview consent form (appendix P)
- 2 stamped and addressed return envelopes (1 brown, 1 white)

5.3.6 Data collection

A questionnaire was used to elicit diet and exercise behaviours; perceptions of high cholesterol; perceived future risk of cardiovascular diseases; and perceived availability of social support from participants in the UK (appendix N). The components of the questionnaire will be listed below. A brief description and the rationale for using each component of the questionnaire was presented in the data collection section of the Nigeria quantitative study (Section 4.3.4):

- Measure of dietary consumption (Section 2 of questionnaire - Appendix N)

- Measure of dietary behaviour change (Section 2 of questionnaire - Appendix N)
- Measure of level of physical activity (Section 3 of questionnaire - Appendix N)
- Measure of exercise behaviour change (Section 3 of questionnaire - Appendix N)
- Measure of adherence to statins (Section 4 of questionnaire - Appendix N)
- Perceptions of high cholesterol (Section 5 of questionnaire - Appendix N)
- Perceptions of future risk of cardiovascular disease (Section 6 of questionnaire - Appendix N)
- Perceived availability of social support (Section 7 of questionnaire – Appendix N)

5.3.7 Data analysis

Data from administered questionnaires was entered into the Statistical Package for the Social Sciences (SPSS) by the researcher. Participants who reported being in the pre-contemplation, contemplation or decision stages were classified as non-adopters of a low-fat diet or healthy exercise behaviours because at the time of the study they were not reportedly reducing their fat intake or increasing the frequency or intensity of their exercise. Participants who reported being in the action or maintenance stages, were classified as adopters of a low-fat or healthy exercise behaviours because at the time of the study, they were reportedly decreasing the amount of fat in their diet or increasing the frequency or intensity of their exercise.

Reverse scoring was taken into account during data entry of the subscales of the IPQ-R (Moss-Morris et al., 2002). The total score was calculated for all subscales of the IPQ-R except the cause subscales, Champion's health belief model scale and MOS social support survey. The total score for each of the subscales in these scales were divided by the total number of items in each subscale to produce a mean sub-scale score. In accordance with the instructions for the IPQ-R, the cause subscales were not treated as scales, thus the total scores of each of the cause subscales were calculated and were presented in the results tables (Champion, 1984, Moss-Morris et al., 2002, Pallant, 2010, Sherborne and Stewart, 1991).

Descriptive analysis

For each continuous variable (see Table 5.3), normality of the data was assessed and a summary statistic e.g. mean/median and a measure of spread e.g. standard deviation was calculated and presented. The frequencies of the categorical variables presented in Table 5.3 were also calculated and presented.

Continuous variables	Categorical variables
Age	Statin-status
Causal perceptions of high cholesterol	Age categories
Number of friends and close relatives	Gender
	Education level
	Marital status
	Dietary behaviours
	Exercise behaviours
	Perceptions of high cholesterol
	Perceptions of future risk of CVD
	Forms of social support

Table 5.3: Table of continuous and categorical data .

Univariate analysis

Independent t-tests and X^2 tests were used to assess the between group differences (statin users vs. non-statin users) in the variables presented in Table 5.3 (Field, 2009). Mann-Whitney tests were used to assess between group differences in continuous variables that were not normally distributed. Fisher's exact tests were used to assess between group differences for categorical variables where the expected frequency in any category was less than 5.

Multivariate analysis

Variables that demonstrated significant between group differences from univariate analysis were entered into logistic regression models to examine whether they would be significantly associated with the adoption of low-fat diet or the adoption of healthy exercise behaviours.

5.3.8 Ethical considerations

Informed consent

Questionnaires: To ensure participants made an informed decision about their participation in this study, a clear and concise information sheet detailing: the purpose of this research; what participation entailed; the freedom to withdraw; and the process of withdrawal was included in the questionnaire packs posted to

potential participants (see appendix M). The return of completed questionnaires post was deemed as implied consent.

Confidentiality and anonymity

The information sheet (appendix M) were used to inform participants that all data would be confidential and used solely for the purpose of this research. Data was anonymised to protect the identity of participants. Signed consent forms and any other identifiable data were kept separately from filled questionnaires.

Participant burdens

The questionnaire was kept as short as possible to reduce the burden on participants and all questions with the exception of 2 were tick boxes. Furthermore, stamped and addressed envelopes were provided for participants to use to return the questions.

Data protection

All computerised data was password protected and all hard copies of data such as filled questionnaires, were safely stored in a locked cabinet in Leeds Institute of Health Science.

Ethical approval

This study received ethical approval from NRES committee East of England (see appendix Q).

5.4 Results

This section begins with a description of participant demographics. This will be followed by data on dietary and exercise behaviours; perceptions of high cholesterol; and perceptions of future cardiovascular disease risk. This results section will conclude with the findings from the logistic regression models used to identify factors that were associated with the adoption of a low-fat diet and healthy exercise behaviours in the study sample.

The intention was that data would be presented based on the following 3 categories namely: statin status, gender and research site as was done in the Nigeria study. However, participants were anonymously recruited from the South Yorkshire Cohort and their location was unknown to the researcher, thus comparison based on site of recruitment was not possible. Furthermore, only 8 participants were non-statin users, thus a univariate analysis comparing statin users and non-statin users was not deemed feasible. Consequently, post-hoc analysis was performed that compared participants based on their dietary status (dietary adopters vs dietary non-adopters) and their exercise status (exercise adopters vs exercise non-adopters). The rationale for doing this was to assess whether illness perceptions especially those related to statin-use differed between adopters of healthy dietary and exercise behaviours and non-adopters. The data for the overall population will be presented followed by data on the following 3 categories: dietary status, exercise status and gender.

A total of 250 questionnaires were posted to members of the South Yorkshire Cohort who met the study inclusion criteria. A total of 103 participants (41%) responded: 10 declined to participate; 4 were excluded because at the time of receiving the questionnaire, they were not statin users and did not have high cholesterol thus did not fit the study inclusion criteria; and 89 were included in the analysis (36%). The number of participants that completed each section of the questionnaire is presented in Figure 5.1. Little's MCAR test was done to assess whether missing data occurred randomly in the data set ($\chi^2=1217.723$, $p=1.00$). The p value obtained is greater than 0.05. This indicates that the probability of missing data occurring randomly was greater than 5% thus it can be inferred that missing data occurred at random.

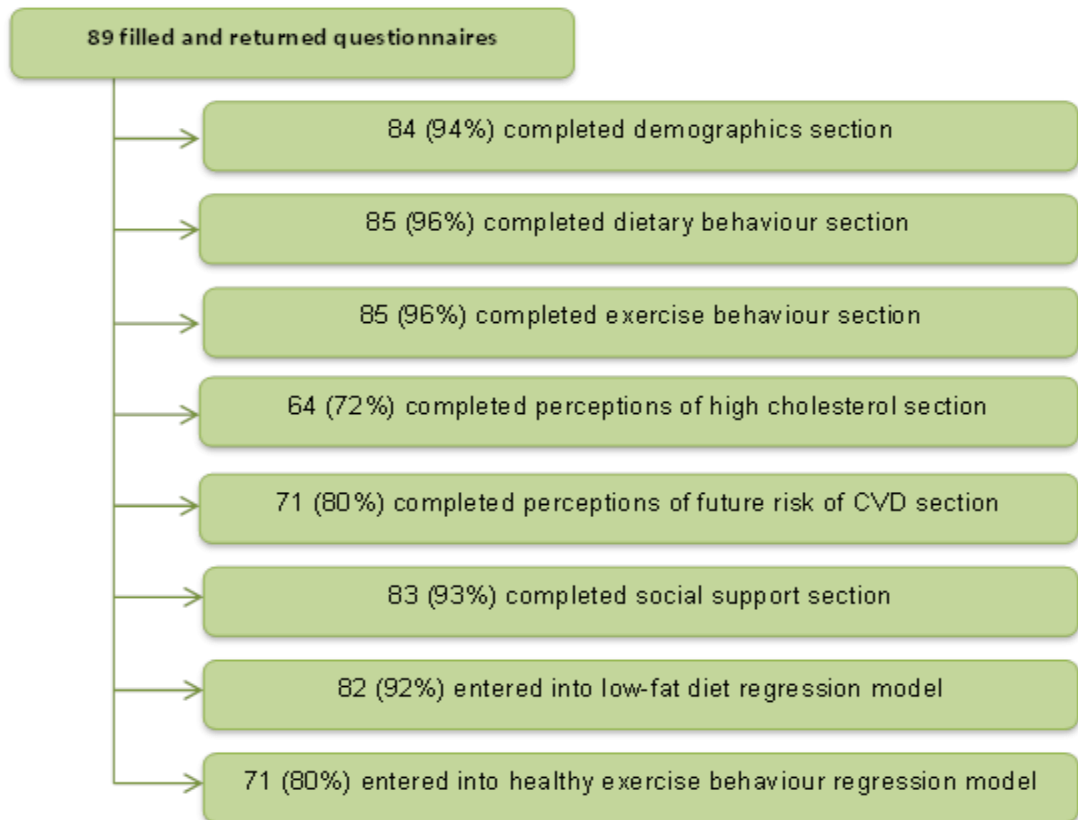


Figure 5.1: Schematic diagram showing the number of participants that completed each section of the questionnaire in UK study sample.

5.4.1 Characteristics of the study sample

The demographics section of 84 (94%) of the 89 returned questionnaires were completed. Majority of the study sample were statin users (91%), 51% were females, married (61%), and had primary education or less (56%). As shown in Table 5.4 the mean age of the sample was 69-years (SD=8.23), most participants were aged between 60-89years (82%).

Dietary adopters and dietary non-adopters significantly differed in age: 92% of dietary adopters were aged between 50-79years compared to 78% of dietary non-adopters (Fisher's exact=10.097, $p=0.025$). In addition to being younger, more dietary adopters reported having tertiary education (40% vs 30%, Fisher's exact=1.0074, $p=0.623$) and claimed to be either separated or divorced (16% vs 7%, Fishers exact=1.568, $p=0.693$). However, neither of the latter 2 were statistically significant.

Exercise adopters and exercise non-adopters also differed in age and level of education, however, neither were statistically significant. Less exercise adopters were above the age of 80-years than exercise non-adopters (3.6% vs 11.2%, $p=0.066$) and unlike dietary adopters who reported having more tertiary education, more exercise adopters reported having primary education or less (64% vs 53%, Fisher's exact=2.533, $p=0.266$).

Male and female participants significantly differed in marital status. More female participants reported being widowed than males (20% vs 2%, $p=0.004$).

Variable	Dietary adopters n= 62 (69.7%)	Dietary non-adopters n= 27 (30.3%)	Overall n=89 (100%)
Mean age(years) (SD)	68.5 (6.90)	68.5 (10.81)	68.5 (8.23)
50-59	7 (11.3)	7 (25.9)	14 (15.7)*
60-69	23 (37.1)	7 (25.9)	30 (33.7)
70-79	27 (43.5)	7 (25.9)	34 (38.2)
80-89	3 (4.8)	6 (22.2)	9 (10.1)
90-99	1 (1.6)	0 (0)	1 (1.1)
Unknown	1 (1.6)	0 (0)	1 (1.1)
Gender			
Male	29 (46.8)	14 (51.90)	43 (48.3)
Female	32 (51.6)	13 (48.1)	45 (50.6)
Unknown	1 (1.6)	0 (0)	1 (1.1)
Education			
Primary or less	34 (54.8)	16 (59.3)	50 (56.2)
Secondary or less	1 (1.6)	0 (0.0)	1 (1.1)
Tertiary	25 (40.3)	8 (29.6)	33 (37.1)
Unknown	2 (3.2)	3 (11.1)	5 (5.6)
Marital status			
Single	9 (14.5)	4 (14.8)	13 (14.6)
Married	37 (59.7)	17 (63.0)	54 (60.7)
Separated/divorced	10 (16.1)	2 (7.4)	12 (13.5)
Widowed	6 (9.7)	4 (14.8)	10 (11.2)
Statin status			
Statin user	57 (91.9)	24 (88.9)	81 (91.0)
Non-statin user	5 (8.1)	3 (11.1)	8 (9.0)

Table 5.4 : Characteristics of the UK study sample.

* p≤0.05

5.4.2 Dietary behaviours

The dietary behaviours section of 85 (96%) of the 89 returned questionnaires were completed. As shown in Table 5.5, most participants (81%) reportedly consumed fried foods on a weekly basis. The majority (73%) of participants reported doing so at home, while only 37% reported doing so away from their homes. Three quarters of participants had reportedly decreased the amount of fat in their diet at some point in their lives and 70% claimed they were still doing so at the time of the study i.e. had adopted a low-fat diet. Most dietary adopters (84%) had reportedly been limiting the amount of fat in their diet for at least a year prior to the study. Only 15% of non-adopters reportedly considered limiting the amount of fat in their diet in the month prior to the study.

Exercise adopters and exercise non-adopters significantly differed in their adoption of a low-fat diet: the odds of reportedly ever decreasing dietary fat consumption at some point in life was 5 times higher in exercise adopters than in exercise non-adopters ($X^2=4.618$, $p=0.046$). Furthermore, the odds of reportedly adopting a low-fat diet was 4 times higher in exercise adopters than in exercise non-adopters ($X^2=4.980$, $p=0.045$). However, although not statistically significant, more exercise adopters reportedly consumed fried foods away from home a weekly basis than exercise non-adopters (46% vs 33%, $X^2=1.140$, $p=0.347$).

Males and females differed in their consumption of fried foods: although not statistically significant, males reportedly consumed more fried foods on a weekly basis than females (65% vs 56%, $X^2=0.253$, $p=0.783$). However, this was not statistically significant.

Variable	Exercise adopters n=28 (31.5%)	Exercise non-adopters n=61 (68.5%)	Overall n=89 (100%)
Fried food consumption			
Weekly fried food consumption			
Yes	22 (78.6)	50 (82.0)	72 (80.9)
No	6 (21.4)	10 (16.4)	16 (18.0)
Unknown	0 (0.0)	1 (1.6)	1 (1.1)
Weekly fried food consumption at home			
Yes	19 (67.9)	46 (75.4)	65 (73.0)
No	9 (32.1)	15 (24.6)	24 (27.0)
Weekly fried food consumption away from home			
Yes	13 (46.4)	20 (32.8)	33 (37.1)
No	15 (53.6)	38 (62.3)	53 (59.6)
Unknown	0 (0.0)	3 (4.9)	3 (3.4)
Ever decreased dietary fat consumption			
Yes	26 (92.9)	43 (70.5)	69 (77.5)*
No	2 (7.1)	16 (26.2)	18 (20.2)
Unknown	0 (0)	2 (3.3)	2 (2.2)
Currently decreasing dietary fat consumption			
Yes (adopters)	24 (85.7)	38 (62.3)	62 (69.7)*
No (non-adopters)	4 (14.3)	23 (37.7)	27 (30.3)
<u>Adopters only</u>			
Duration of decreasing dietary fat consumption			
<1 month	0 (0.0)	0 (0.0)	0 (0.0)
1-6 months	3 (12.5)	3 (7.9)	6 (9.7)
7-12 months	3 (12.5)	1 (2.6)	4 (6.5)
>12 months	18 (75.0)	34 (89.5)	52 (83.9)
Currently eating a low-fat diet			
Yes	16 (66.7)	29 (76.3)	45 (72.6)
No	8 (33.3)	8 (21.1)	16 (25.8)
Unknown	0 (0.0)	1 (2.6)	1 (1.6)
<u>Non-adopters only</u>			
Considered reducing dietary fat consumption in the past month			
Yes	0 (0.0)	4 (17.40)	4 (14.8)
No	2 (50.0)	17 (73.90)	19 (70.4)
Unknown	2 (50.0)	2 (8.7)	4 (14.8)

Table 5.5: Dietary behaviours of the UK study sample.

* $p \leq 0.05$.

5.4.3 Exercise behaviours

The exercise behaviours section of 85 (96%) of the 89 returned questionnaires were completed. Majority of the study sample (79%) were classified as inactive/moderately inactive and just under half (49%) claimed they had never increased the frequency/intensity of their exercise. As shown in Table 5.6, majority of participants (69%) had reportedly not adopted healthy exercise behaviours. Most (64%) of these non-adopters claimed they had not considered adopting healthy exercise behaviours in the month prior to the study.

Dietary adopters and dietary non-adopters significantly differed in their adoption of healthy exercise behaviours. The odds of reportedly ever increasing frequency or intensity of exercise at some point in life was 4 times higher in dietary adopters than in dietary non-adopters ($X^2=6.892$, $p=0.015$). Similarly, the odds of reportedly adopting healthy exercise behaviours at the time of the study was 4 times higher in dietary adopters than in dietary non-adopters ($X^2=4.980$, $p=0.045$).

Males and females did not report any notable differences in their exercise behaviours

Variable	Dietary adopters n= 62 (69.7%)	Dietary non-adopters n= 27 (30.3%)	Overall n=89 (100%)
Physical activity level			
Inactive/moderately inactive	51 (82.3)	19 (70.4)	70 (78.7)
Active/moderately active	11 (17.7)	5 (18.5)	16 (18.0)
Unknown	0 (0.0)	3 (11.1)	3 (3.4)
Ever increased frequency/intensity of exercise			
Yes	34 (54.8)	6 (22.2)	40 (44.9)*
No	26 (41.9)	18 (66.7)	44 (49.4)
Unknown	2 (3.2)	3 (11.1)	5 (5.6)
Currently doing more exercise			
Yes (adopters)	24 (38.7)	4 (14.8)	28 (31.5)*
No (non-adopters)	38 (61.3)	23 (85.2)	61 (68.5)
Adopters only			
Duration of increasing frequency/intensity of exercise			
<1 month	4 (16.7)	1 (25.0)	5 (17.9)
1-6 months	5 (20.8)	2 (50.0)	7 (25.0)
7-12 months	2 (3.3)	0 (0.0)	2 (7.10)
> 12 months	9 (37.5)	0 (0.0)	9 (32.1)
Unknown	4 (16.7)	1 (25.0)	5 (17.9)
Non-adopters only			
Considered increasing frequency/intensity of exercise in the past month			
Yes	13 (34.2)	5 (21.7)	18 (29.5)
No	23 (60.5)	16 (69.6)	39 (63.9)
Unknown	2 (5.3)	2 (8.7)	4 (6.6)

Table 5.6: Exercise behaviours of the UK study sample.

* $p \leq 0.05$

5.4.4 Perceptions of high cholesterol

The perceptions of high cholesterol section of 64 (72%) of the 89 returned questionnaires were completed. As shown in Table 5.7, the highest scores obtained from the overall sample were for reported perceptions of statin control of high cholesterol (3.58, SD=0.60) followed by reported perceptions of personal control of high cholesterol (3.57, SD=0.70). This indicates that participants reportedly believed their high cholesterol could be controlled by their statin and by their own behaviour. Although reported perceptions of the statin control were slightly stronger than those of personal control, the most common cause of high cholesterol identified by participants was lifestyle factors. The lowest scores obtained were for perceived consequences of high cholesterol (2.47, SD=0.57) and perceived emotional response to high cholesterol (2.26, SD=0.68). This indicates that high cholesterol was not perceived to have serious consequences and participants reportedly experienced low emotional responses to their high cholesterol.

Dietary adopters and non-adopters differed in their reported control perceptions and perceived cause of high cholesterol. Dietary adopters reported stronger personal and statin control perceptions than dietary non-adopters, however, only the former was statistically significant (3.65 vs 3.37, Mann Whitney U=281.500, $p=0.043$). It should be noted that while dietary adopters reported slightly stronger personal control perceptions than statin control perceptions. The reverse was the case with dietary non-adopters i.e. they reported stronger statin control perceptions than personal control perceptions. Yet despite this, dietary non-adopters reported stronger lifestyle causal perceptions than non-adopters. However, this was not statistically significant (23.22 vs 21.43, $t=-1.198$, $p=0.236$).

Exercise adopters and exercise non-adopters also differed in their reported control perceptions and perceived cause of high cholesterol. As was the case with dietary adopters, exercise adopters also reported stronger personal (3.68, vs 3.52, Mann Whitney U=405.000, $p=0.503$) and statin control beliefs than exercise non-adopters (3.68 vs 3.53, $t=0.919$, $p=0.362$). However unlike the case with dietary adopters, exercise adopters reported significantly stronger lifestyle causal perceptions than exercise non-adopters (24.00, vs 20.93, $t=2.205$, $p=0.031$). In addition to this, exercise adopters reported stronger illness coherence perceptions than exercise non-adopters. This indicates that they reportedly felt they understood their high cholesterol better than exercise non-adopters (3.62 vs 3.47, Mann Whitney U=403.500, $p=0.450$).

Male and female participants also differed in their perceived cause of high cholesterol and reported control perceptions. Male participants reportedly significantly stronger lifestyle causal perceptions than female participants (23.87 vs 20.21, $t=2.856$, $p=0.006$). Consistent with this is the finding that male participants reported stronger personal (3.71, vs 3.42, Mann Whitney $U=390.500$, $p=0.143$) and statin control perceptions than female participants (3.70, vs 3.52, $t=1.256$, $p=0.214$). Furthermore, male participants reported slightly stronger personal control perceptions than statin control perceptions. The reverse was the case with female participants.

Variable	Dietary adopters n= 46 (SD)	Dietary non-adopters n= 18(SD)	Overall n=64 (SD)
Mean perceived timeline acute/chronic	3.33 (0.58)	3.35 (0.70)	3.33 (0.61)
Mean perceived timeline cyclical	2.63 (0.73)	2.58 (0.71)	2.62 (0.72)
Mean perceived consequences	2.47 (0.59)	2.44 (0.54)	2.47 (0.57)
Mean perceived personal control	3.65 (0.73)	3.37 (0.53)	3.57 (0.70)*
Mean perceived statin control	3.63 (0.63)	3.46 (0.54)	3.58 (0.60)
Mean perceived emotional response	2.27 (0.72)	2.24 (0.58)	2.26 (0.68)
Mean perceived illness coherence	3.54 (0.96)	3.44 (0.86)	3.52 (0.93)
Total perceived biomedical cause [£]	13.02 (4.14)	13.72 (2.08)	13.22 (3.68)
Total perceived spiritual cause [€]	6.22 (2.31)	7.33 (2.22)	6.53 (2.32)
Total perceived lifestyle cause [§]	21.43 (5.76)	23.22 (4.17)	21.94 (5.39)

Table 5.7: Perceptions of high cholesterol in the UK sample.

* $p \leq 0.05$, £ this sub-scale has 5 items and scores range between 5-25, € this subscale has 3 items and scores range between 3-15, § this subscale has 8 items and scores range between 8-40.

5.4.5 Perceptions of future risk of cardiovascular disease

The perceptions of future risk of cardiovascular disease section of 71 (80%) of the 89 returned questionnaires were completed. As shown in Table 5.8, the highest scores obtained from the overall sample were for perceived benefits of healthy lifestyle choices (3.85, $SD=0.48$), followed by perceived benefits of statin-use for the prevention of cardiovascular disease (3.44, $SD=0.64$). This indicates that participants reportedly perceived healthy lifestyle choices to be more beneficial than statin-use for the prevention of cardiovascular disease. This conflicts with the findings that participants reportedly believed that statin-use could control their high cholesterol better than their own behaviours. Despite being reportedly perceived as more beneficial for cardiovascular disease prevention, healthy lifestyle choices were reportedly considered to have more barriers than statin-use (2.36, vs 1.93 $SD=0.66$). It should however be noted that scores for perceived barriers to both

healthy lifestyle choices and statin-use were rather low indicating that participants did not perceived strong barriers to either control strategy.

Dietary adopters and dietary non-adopters differed in their perceived benefits of and barriers to the adoption of healthy lifestyle choices and statin-use for cardiovascular disease prevention. Dietary adopters perceived significantly stronger benefits of (3.92 vs 3.67, Mann Whitney U=334.500, p=0.022) and fewer barriers to (2.30 vs 2.55, t=-1.422, p=0.159) the adoption of healthy lifestyle choices for the prevention of cardiovascular disease than dietary non-adopters. However, only the former was statistically significant. Likewise, dietary adopters perceived more benefits of (3.49 vs 3.30, t=1.131, p=0.262) and fewer barriers to (1.84 vs 2.18, t=-1.958, p=0.054) statin-use for cardiovascular disease prevention than dietary non-adopters, only the latter statistically significant.

Exercise adopters and exercise non-adopters also differed in their perceived benefits of and barriers to the adoption of healthy lifestyle choices and statin-use for cardiovascular disease prevention. Similar to dietary adopters, exercise adopters also perceived more benefits of healthy lifestyle choices (3.95 vs 3.80, Mann Whitney U=497.000, p=0.215) and fewer barriers to statin-use (1.78 vs 2.02, t=-1.509, p=0.136) for the prevention of cardiovascular disease than non-exercise adopters. Neither of these findings were statistically significant.

Male and female participants differed in their perceived benefits of statin-use for cardiovascular disease prevention. Male participants reportedly perceived stronger benefits of statin-use for the prevention of cardiovascular disease than females (3.52, vs 3.32, t=1.345, p=0.183). However this was not statistically significant. Aside from this, males and females reported similar perceptions of their future risk of cardiovascular disease.

Variables	Dietary adopters n=53 (SD)	Dietary non-adopters n= 19 (SD)	Overall n= 72 (SD)
Perceived susceptibility to CVD	3.01 (0.55)	3.12 (0.44)	3.04 (0.52)
Perceived severity of CVD	2.58 (0.54)	2.68 (0.55)	2.61 (0.54)
Perceived benefits of statin-use for CVD prevention	3.49 (0.68)	3.30 (0.48)	3.44 (0.64)
Perceived benefits of healthy lifestyle choices for CVD prevention	3.92 (0.49)	3.67 (0.38)	3.85 (0.48)*
Perceived barriers to statin-use for the prevention of CVD	1.84 (0.67)	2.18 (0.58)	1.93 (0.66)*
Perceived barriers to healthy lifestyle choices for the prevention of CVD	2.30 (0.65)	2.55 (0.67)	2.36 (0.66)

Table 5.8: Perceptions of future risk of cardiovascular disease in the UK sample.

* p≤0.05

5.4.6 Perceived availability of social support

The perceived availability of social support section of 83 (90%) of the 89 returned questionnaires were completed. As shown in Table 5.9, the average number of close relatives and friends reported by the overall study sample was 5 (SD=5.21). The overall scores for the various types of functional social support measured were relatively high. This indicates that participants reportedly perceived that the various forms of functional social support was available to them at the time of the study. The highest score obtained was for perceived availability of affectionate support (4.11, SD=1.22). The lowest score obtained was for perceived availability of emotional and informational support (3.84, SD=1.16). This indicates that participant perceived that they had less advice/guidance/feedback as well as care and encouragement available to them than they did affection.

Dietary adopters and dietary non-adopters slightly differed in their perceived availability of the various forms of social support. Although not statistically significant, dietary adopters reportedly perceived higher levels of emotional/informational support, affectionate support and positive social interaction than dietary non-adopters.

Exercise adopters and exercise non-adopters significantly differed in their perceived number of close relatives and friends. Exercise adopters reportedly had significantly more close relatives and friends than exercise non-adopters (7, vs 4, Mann Whitney U=445.000, $p=0.003$). Exercise adopters also claimed to have more positive social interactions than exercise non-adopters. However was not statistically significant (4.23, vs 4.02, Mann Whitney U=707.500, $p=0.639$).

Males and females also differed in their perceived availability of the various forms of social support. Despite reportedly having 1 less friend on average, females reportedly had more of all 4 forms of social support available to them than males, however only tangible support was found to be significantly higher in females than in males (4.06 vs 3.49, Mann Whitney U=625.000, $p=0.054$).

Variables	Dietary adopters n=60 (SD)	Dietary non-adopters n=24 (SD)	Overall n=84 (SD)
Median number of friends (n=83: Diet ad=59, Diet non-ad=24)	4.00 (5.53)	4.50 (4.42)	4.00 (5.22)
Mean perceived available tangible support	3.83 (1.30)	3.89 (1.30)	3.85 (1.30)
Mean perceived available emotional and informational support	3.90 (1.11)	3.70 (1.30)	3.84 (1.16)
Mean perceived available affectionate support	4.18 (1.16)	3.94 (1.39)	4.11 (1.22)
Mean perceived available positive social interaction	4.13 (1.03)	3.96 (1.20)	4.08 (1.08)

Table 5.9: Perceived availability of social support in the UK sample.

* $p \leq 0.05$

5.4.7 Factors associated with the adoption of a low-fat diet

Of the 89 returned questionnaires, 82 (88%) completed all sections of the questionnaire that were entered into a logistic regression model. A logistic regression was performed to assess which of the following 4 reported variables were associated with the adoption of a low-fat diet: exercise adoption status; perceived personal control of high cholesterol; perceived benefits of adopting healthy lifestyle choices for cardiovascular disease prevention; and perceived barriers to statin-use for the prevention of cardiovascular disease.

The logistic regression model was not statistically significant ($X^2 = 9.124$, $p = 0.058$) but correctly classified 72% of cases. The model explained between 10.5% (Cox and Snell R^2) and 15.2% (Nagelkerke R^2) of variance in the adoption of a low-fat diet and the Hosmer and Lemeshow test of fit indicated that the model was a good fit to the data ($X^2 = 7.726$, $p = 0.461$). As shown in Table 5.10 none of the variables made a statistically significant contribution to the model.

Variables	B	S.E	Wald	P value	OR	95%CI
Exercise adoption status (yes)	0.79	0.64	1.53	0.216	2.2	0.63 - 7.71
Personal control of high cholesterol	0.24	0.42	0.43	0.510	1.32	0.58 - 3.02
Benefits of healthy lifestyle choices for CVD prevention	0.82	0.57	2.08	0.150	2.28	0.74 - 7.02
Barriers to statins-use to prevent CVD	-0.32	0.41	0.59	0.441	0.73	0.32 - 1.63

Table 5.10: Logistic regression model for adoption of a low-fat diet in the UK sample.

5.4.8 Factors associated with the adoption of healthy exercise choices.

Of the 89 returned questionnaires, 78 (88%) completed all sections of the questionnaire that were entered into a logistic regression model. A logistic regression was performed to assess which of the following 5 reported variables

were associated with the adoption of healthy exercise behaviours: aged between 50 - 79 years; exercise adoption status; number of close family and friends; and total perceived lifestyle cause of high cholesterol.

The logistic regression model was statistically significant ($X^2= 21.134$, $p<0.001$) and correctly classified 73.2% of cases. The model explained between 25.7% (Cox and Snell R^2) and 35.7% (Nagelkerke R^2) of variance in the adoption of healthy exercise behaviours and the Hosmer and Lemeshow test of fit indicated that the model was a good fit to the data ($X^2= 6.83$, $p=0.555$). As shown Table 5.11, 1 variable made a statistically significant contribution to the model, namely number of close relatives and friends. The odds of adopting healthy exercise behaviours increased as the number of reported close family and friends increased.

Variables	B	S.E	Wald	P value	OR	95%CI
Aged 50-79 years (yes)	19.85	16862.90	0.00	0.99	419623322.00	0.00 - .
Diet adoption status (yes)	0.96	0.76	1.57	0.21	2.60	0.58 – 11.59
Number of close family and friends	0.38	0.12	10.67	0.001***	1.47	1.17 – 1.85
Total perceived cause of lifestyle	0.11	0.06	3.41	0.065	1.12	0.99 – 1.25

Table 5.11: Logistic regression model for adoption of healthy exercise choices in the UK sample.

In summary, the study sample consisted of 89 participants mainly aged between 50-79 years, married (61%), female (51%), had primary education or less (56%) and were predominantly statin users (91%). Majority of the sample reported that they had adopted a low-fat diet (70%) yet only 32% reportedly adopted healthy exercise behaviours and 79% were classified as inactive/moderately inactive.

More dietary adopters and exercise adopters claimed to be under the age of 80-years than dietary non-adopters and exercise non-adopters. However only the former was statistically significant. More dietary adopters reported having tertiary education while more exercise adopters reported having primary education, however neither of these findings were statistically significant. Interestingly, although the odds of adopting a low-fat diet was 4 times higher in exercise adopters than in exercise non-adopters, more exercise adopters reportedly consumed fried foods away from home on a weekly basis than exercise non-adopters. The odds of adopting healthy exercise behaviours was 4 times higher in dietary adopters than dietary non-adopters.

Participants reportedly considered their high cholesterol to be controllable and caused by lifestyle factors but reported slightly stronger statin control perceptions than personal control perceptions. They also perceived that high cholesterol did not have serious consequences and reportedly experienced low emotional responses to their high cholesterol. Dietary adopters and exercise adopters reported stronger personal control perceptions and statin control perceptions than dietary non-adopters and exercise non-adopters i.e. adopters perceived high cholesterol to be more controllable than non-adopters. Likewise, male participants reported stronger personal control and statin control perceptions than females. However, while exercise adopters and male participants reported stronger lifestyle causal perceptions than exercise non-adopters and females, only the former was statistically significant. Dietary adopters reported weaker lifestyle causal perceptions than dietary non-adopters, however this was not statistically significant.

Adopting healthy lifestyle choices was reportedly perceived as more beneficial for the prevention of cardiovascular disease than statin-use, yet participants reportedly perceived fewer barriers to the latter than to the former. Both dietary adopters and exercise adopters reportedly perceived more benefits of making healthy lifestyle choices and fewer barriers to statin-use for the prevention of cardiovascular disease than dietary non-adopters and exercise non-adopters. Finally participant generally claimed that the various forms of functional social support were available to them at the time of the study and exercise adoption was significantly associated with reported number of close family and friends.

Chapter 6 : The qualitative study (Study 3)

6.1 Chapter overview

This chapter will begin by stating the aims and objectives of this qualitative study. This will be followed by a description of the research methods employed to fulfil these aims. The findings of this study will be described in this chapter but will be discussed in chapter 7 alongside a discussion of the findings of the Nigeria quantitative study and the UK quantitative study. The limitations of this study will also be presented in chapter 7 alongside the limitations of the other studies conducted as part of this research.

6.2 Study aims

This study aimed to examine whether statin-use influences the adoption of healthy dietary and exercise choices by changing the way people think of high cholesterol as a risk factor for cardiovascular disease in the context of their social world. To fulfil this aim, the following research questions were explored:

1. Do people narrate meaningful accounts of how statin-use influences their dietary and exercise behaviours?
2. Do people narrate meaningful accounts of how statin-use influences their perceptions of high cholesterol; perceived future risk of cardiovascular disease; perceived availability of social support; and how this influences their subsequent lifestyle choices?
3. Do people narrate meaningful accounts of how social factors influence the following?
 - Statin-use
 - Adoption of a low-fat diet and healthy exercise behaviours
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
- 4) Are there meaningful differences in the way the Nigeria sample and UK sample narrate the following?
 - Adoption of a low-fat diet and healthy exercise behaviours
 - Perceptions of high cholesterol
 - Perceptions of future risk of cardiovascular disease
 - Perceived availability of social support

6.3 Methods

In the section below, the study design and settings will be presented. The details of the inclusion and exclusion criteria and participant recruitment strategies will also be presented. This section concludes with a description of the data collection and analysis techniques employed to answer the research questions and fulfil the research aims.

6.3.1 Study design

Face-to-face, in-depth interviews were used to elicit participants' accounts of the influence of statin-use on their adoption of a low-fat diet and/or healthy exercise behaviours; the influence of statin-use on their perceptions of high cholesterol and perceived future risk of cardiovascular disease; and the influence of social factors on the aforementioned health behaviours and illness perceptions.

6.3.2 Study setting

To allow for an exploration of the influence of social factors on statin-use; the adoption of a low-fat diet and health exercise behaviours; perceptions of high cholesterol; and perceived future risk of cardiovascular diseases, this research was conducted in 2 countries. The first country in which this study was conducted was Nigeria. The same urban (NNPC) and semi-urban (UCTH) research sites from which participants were recruited in the Nigeria quantitative study were used to recruit participants for this qualitative study (see section 4.3.2 for further details). Nigeria interviews were conducted in a free consultation room in both hospitals. The second country in which this study was conducted was the UK. As was done in the UK quantitative study, the South Yorkshire Cohort was used to recruit participants for this study (see section 5.3.2 for further details). All but 1 of the UK interviews were conducted in interviewees' homes in South Yorkshire. One interview was conducted in a coffee shop near the participants' home.

6.3.3 Study participants

Nigerian sample

Based on the questionnaires filled in study 1 (Nigeria quantitative study), purposive sampling was used to identify potential interviewees from the quantitative sample who fell into the 4 groups shown in Table 6.1 below. The intention was to recruit 4 participants from each group to make a Nigeria interviewee sample of 16 participants.

Statin users	Non-statin users
Adopters of a low-fat diet and/or healthy exercise behaviours	Adopters of a low-fat diet and/or healthy exercise behaviours
Non-adopters of both a low-fat diet & healthy exercise behaviours	Non-adopters of both a low-fat diet & healthy exercise behaviours

Table 6.1: Inclusion criteria for the Nigeria sample of the qualitative study.

UK sample

Once completed questionnaires were received by the researcher, they were analysed and used to decide which participants were recruited into this qualitative study. No non-statin users expressed an interest in taking part in interviews. Thus purposive sampling was used to identify potential interviewees from the quantitative sample who fell into the 8 groups shown in Table 6.2 below. The intention was to recruit 2 participants from each group to make a UK interviewee sample of 16 participants.

Male	Female
Adopters of low-fat diet only	Adopters of low-fat diet only
Adopters of healthy exercise behaviours only	Adopters of healthy exercise behaviours only
Adopters and a low-fat diet and healthy exercise behaviours	Adopters and a low-fat diet and healthy exercise behaviours
Non-adopters of both a low-fat diet and healthy exercise behaviours	Non-adopters of both a low-fat diet and healthy exercise behaviours

Table 6.2: Inclusion criteria for the UK sample of the qualitative study.

6.3.4 Recruitment procedure

Nigeria sample

During recruitment into the Nigeria quantitative study (study 1), participants were informed about interviews via the information sheet (appendix D). On completion of the questionnaire, the researcher verbally went through the interview section of the information sheet and participants were asked if they wanted to take part in the interviews. Those who agreed were asked to give written consent (appendix G) and were immediately interviewed in the same room where the research questionnaire was administered.

UK sample

During recruitment into the UK quantitative study (study 2), potential participants were provided with an invitation to take part in interview sheet (appendix O) in their questionnaire packs. Participants willing to take part in interviews were asked to provide their preferred contact details on this sheet and post it separately from their filled questionnaires. Participants who indicated an interest in taking part in were contacted and a time, date and location that best suited them was scheduled.

6.3.5 Data collection

Existing literature was used to develop an interview guide for each country (see appendix R-S) that guided the topics discussed during interviews (Bryman, 2008). Interviews were audio recorded and subsequently transcribed. The Nigeria interviews were transcribed by the researcher to ensure the correct interpretation of Pidgin and Nigerian slang words. The UK interviews were transcribed by external transcribers but were cross-checked by the researcher.

6.3.6 Data analysis

Thematic analysis, a form of content analysis, was used to identify, analyse and report the key themes/ topics and patterns in interview data. Thematic analysis was chosen because it allows for a description and exploration of the key topics that emerged from interviews guided by the topic guide (Braun and Clarke, 2006, Guest et al., 2011). Thus it provides a rich picture of the key topics that influence the research questions and provides some understanding of how these topic fit together and interact.

Interview transcripts were re-read to ensure transcription was verbatim and to re-familiarize the researcher with interview data. Initial codes were generated and a codebook was developed to define each code and ensure consistency in the coding process. Codes were grouped into themes and themes were later categorized into clusters. The list of codes, themes and the initial interview transcripts were reviewed by both supervisors (Allan House and Kate Hill).

The analysis of the Nigeria study was more inductive than that of the UK study. The Nigeria study was conducted and completely analysed before the UK study was conducted and analysed. Thus initial coding of the Nigeria data was merely about identifying themes in the data. The research question was not at the forefront of the coding process. However, an awareness of the various constructs of the common

sense model may have guided the choice of theme names. The coding process of the UK study was influenced by the themes and clusters found in the Nigeria study. Therefore the analysis for the UK study was more deductive than inductive. However, the researcher attempted to remain open to the emergence of new themes.

6.3.7 Ethical considerations

Informed consent

Interviews: Despite the preference for verbal communication in Nigeria, written consent was obtained for interviews in Nigeria and in the UK. Before the commencement of every interview, the researcher verbally went through the information sheet again with participants and the recorder was only switched on once written consent was obtained (see appendix G &P).

Confidentiality and anonymity

The information sheets were used to inform participants that all data would be confidential and used solely for the purpose of this research. Data was anonymised to protect the identity of participants. Signed consent forms and any other identifiable data were kept separately from interview recordings and manuscripts.

Participant burdens

Interviews were kept as short as possible to reduce the burden on participants and lasted no longer than 60-minutes.

Participants were informed at the beginning of interviews that if they became uncomfortable they should inform the researcher and the interview would be ended. The researcher attended interview training where discussing sensitive issues and abruptly ending interviews was practiced, no such incident occurred during data collection.

The interview questions were piloted with individuals from a Nigerian population and certain questions particularly questions pertaining to the emotional and practical aspects of social support were re-worded to investigate the same concept using culturally appropriate questions.

Data protection

All computerised data was password protected and all hard copies of data such as audio recordings of interviews and interview transcripts were safely stored in a

locked cabinet whilst in Nigeria and in filing cabinets in Leeds Institute of Health Science whilst in the UK.

Ethical approval

The Nigeria study received ethical approval from: Nigerian Institute of Medical Research; University of Calabar Teaching Hospital; Nigerian National Petroleum Corporation (NNPC) Medical Services; and Leeds Institute of Health Sciences and Leeds Institute of Genetics, Health and Therapeutic and Leeds Institute of Molecular Medicine (LIHS/LIGHT/LIMM) joint ethics committee. The UK study received ethical approval from NRES committee East of England (see appendix H-K & Q)

6.4 Results

This section begins with a description of the key themes identified from participant interviews. This will be followed by a description of the key features identified in the body image discourse of female participants. This chapter will conclude with a summary of the key finding from this study.

6.4.1 Characteristics of the study sample

A total of 19 participants were interviewed 8 were recruited from Nigeria and 11 were recruited from the UK. As shown in Table 6.3, all of the participants recruited from the UK were statin users while only 4 of those recruited from Nigeria were statin users. Based on the findings from the Nigeria and UK quantitative studies: 6 participants were classified as adopters of both a low-fat diet and healthy exercise behaviours; 5 diet only adopters; 1 exercise only adopter; and 7 participants were classified as non-adopters of both a low-fat diet and healthy exercise behaviours.

Participants	Recruitment site	Dietary adoption status	Exercise adoption status	Statin status
Nigeria sample				
NG male 1	Semi urban	X	X	✓
NG male 2	Semi urban	✓	✓	✓
NG female 1	Semi-urban	X	X	✓
NG female 2	Semi-urban	✓	X	X
NG female 3	Semi-urban	X	X	X
NG female 4	Semi-urban	✓	X	X
NG female 5	Semi-urban	X	X	✓
NG female 6	Urban	✓	✓	X
UK sample				
UK male couple 1	SYC	✓	✓	✓
UK male couple 2	SYC	X	X	✓
UK male 1	SYC	X	X	✓
UK male 2	SYC	✓	✓	✓
UK male 3	SYC	X	✓	✓
UK male 4	SYC	✓	X	✓
UK female 1	SYC	✓	X	✓
UK female 2	SYC	✓	X	✓
UK female 3	SYC	✓	✓	✓
UK female 4	SYC	X	X	✓
UK female 5	SYC	✓	✓	✓

Table 6.3: Characteristics of participants interviewed.

6.4.2 Themes from participant interviews

Six main themes emerged from the analysis of participant interviews, namely: (i) understanding; (ii) consequences; (iii) cause; (iv) control; (v) *"I just chose"*; and (vi) *"the whole world"*. As shown in Figure 6.1, these themes clustered into 2 areas of discussions, namely: discussions about the medical world of high cholesterol and discussions about the participant as an individual in his/her social world. Themes regarding the medical world of high cholesterol were named according to the aspect of high cholesterol under discussion. Themes regarding the individual in his/her social world were named using a word or phrase participants' themselves used that best describe the area under discussion.

In this section, each main theme will be described and accompanied by relevant interview extracts. In order to provide a well-rounded picture of each theme, the overall narrative for each theme will be presented as will information that differed from general consensus. The sub-themes within each theme and the relationships within and between themes will also be described.

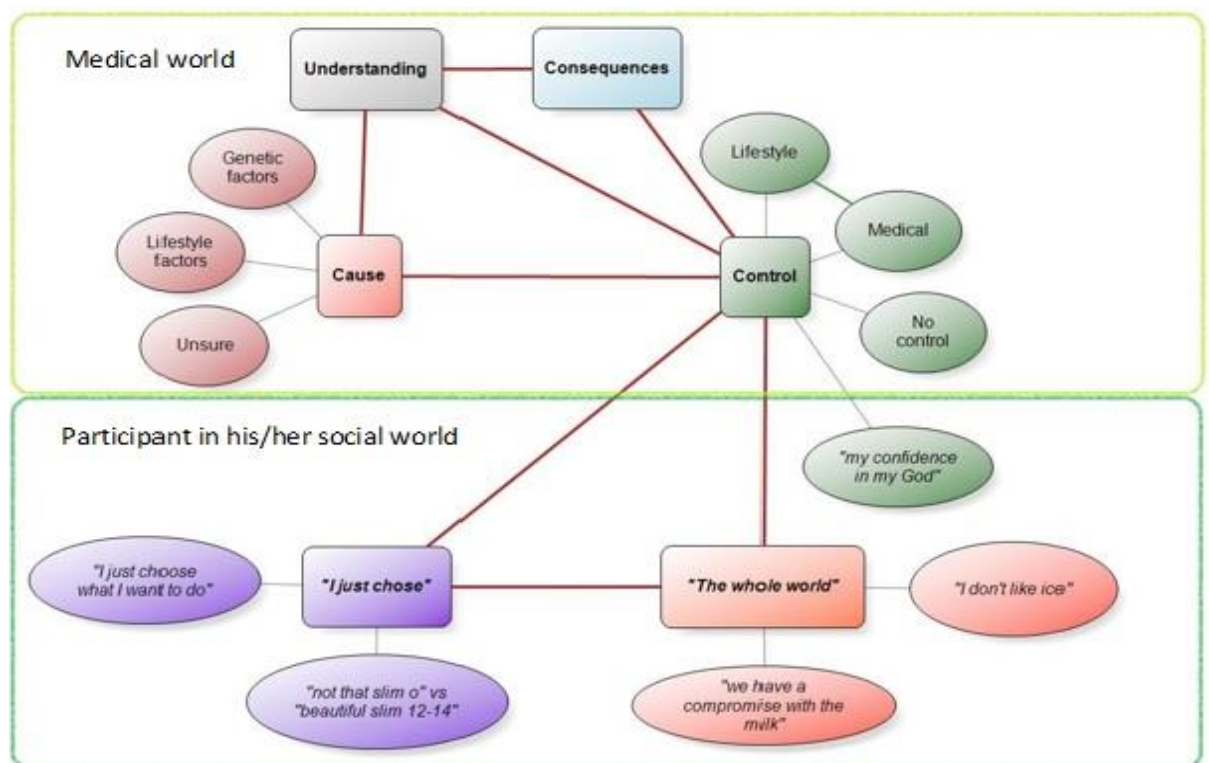


Figure 6.1: Thematic map for study participants.

Main themes (rounded rectangular boxes), sub-themes (oval boxes), relationship between themes (red line) and relationship within themes (green line) identified from interviews with study participants

Theme 1: Understanding

This theme captures information about participants' general understanding of high cholesterol and the sources from which they gained their information. This was only discussed by participants in the UK study. They all discussed passively receiving information from their doctors, the media and everyday life. This was the only mode of knowledge acquisition discussed by UK females. UK males on the other-hand went a step further and explained that they actively sought information from books and the internet. However, the use of the latter to acquire information was negatively depicted.

"Well just life isn't it, you learn things and read things don't you, and doctors of course yes." UK female 2

"just common knowledge... that's just the sort of stuff that you see in the paper or on the news, occasionally, that kind of thing. Deeper than that only I suppose from the net really... I wouldn't want to create the impression that I am hunting through the net, looking for this" UK male 4

Most UK males described high cholesterol as something related to fats in the blood. However, UK females mainly described their high cholesterol in terms of its perceived cause and its perceived consequences. This suggests that perceptions of cause and consequences are linked to the way high cholesterol is understood. A few UK participants were aware that there are 2 types of cholesterol and knew one was good cholesterol and the other was bad cholesterol, but, only the participant who was a nurse was able to differentiate between the 2 types of cholesterol. Although both genders demonstrated limited understanding of high cholesterol, UK females demonstrated a more limited understanding than their male counterparts. This is consistent with the finding that UK males actively sought out information whilst UK females passively received information.

"it is essentially blood fats and that I know there are two sorts, there is high and low and one is...and they are often referred to as good and bad, but which is which I have no idea" UK male 4

"it's part of the pathway for dealing with diabetes that you have to go and be on a statin really, because of all the health problems that can arise if your cholesterol is allowed to rise" UK female 5

UK participants also demonstrated a limited understanding of the lifestyle advice provided for the management of high cholesterol. UK males described the lifestyle advice available as confusing, irresolute and often conflicting. They explained that this hindered the adoption of healthy lifestyle choices as they were unclear about what they should eat, could eat and should avoid. They also mentioned that the

information available about hypertension and diabetes was clearer and seemed resolute which made it easier for them to understand and manage these conditions.

“ For blood pressure and for diabetes a lot of the erm, the good things, the good foods and the bad foods are pretty obvious, whereas for cholesterol, some of them are kind of counter intuitive and I find that the hardest thing If I were thinking, I think if I were thinking you know about cholesterol I would struggle with that because am thinking, yeah but the fish oil, but I thought they were telling me, on the one hand they are telling me it is good for me and on the other hand they are saying eggs are, you know, good for you, so, where do we stand on these?...The messages from the health professionals are not terribly clear and they are even contrary to each other” UK male 4

UK male 4: Well I understand, I better understand the negative impacts of certain things, for example, it is not a good idea to have an awful lot of sugar with the diabetes and it is not a good idea to have salt or sugar for the blood pressure.

Interviewer: So what I am hearing is, with your hypertension and diabetes, you know what caused them and you know what controls them and your high cholesterol, its, you don't know necessarily know what controls it or what causes it?

UK male 4: That is absolutely right.

Despite mentioning that they had a poor understanding of high cholesterol, some UK males expressed no interest in wanting to learn more because they were unperturbed by their high cholesterol (this will be further discussed under the consequence theme).

Theme 2: Consequences

This theme captures descriptions of the perceived consequences of high cholesterol expressed by participants. Nigerian males and UK participants (males and females) generally identified heart attacks and strokes as the potential consequences of their high cholesterol.

“It seems, my understanding is it is particularly associated with stroke, strokes now maybe maybe it causes other heart diseases or problems, I have no doubt it does but if you like the big association is stroke. In the same way that high blood pressure is, you think of a heart attack, cholesterol a stroke, and diabetes, other things” UK male 4

All UK participants voiced their concern that high cholesterol could lead to an early death which they wanted to avoid. UK females explained that they wanted to live longer so they could see their grandchildren grow up. They recounted how a family history of heart conditions and strokes had led to the early deaths of several family members and denied them the opportunity to watch their grandchildren grow-up. This is consistent with the caring and nurturing role that will be discussed as a

component of the social world of female participants under the theme “*The whole world*”. This illustrates how social roles could influence health behaviours. One UK female also mentioned that she did not want to become a chronically ill person whose health would continually deteriorate.

“once you find out that you need to take a statin then you’ve got to try and accustom yourself to that kind of life haven’t you, if you want to live to see your grandchildren grow up. I know we all have to die in the end but it’s nice to be able to prolonged it a bit longer isn’t it?... my sister had a son and he has now got three, two lovely girls, and when I see them I think oh she would have been so proud, and yet she’s not here to see that kind of thing and I think I want to see my grandchildren grow up and, and they’re lovely” UK female 2
“I were just so unfit it were unreal, I thought I’ve got to do something here or else I’m going to be in a black box...I thought the idea of living is when you’re born and when you die is to put the biggest distance you can between you them, now I were making it shorter, the way I were living cause I weren’t doing any exercise” UK male 3

Nigerian males and UK females explained that their desire to avoid the consequences of high cholesterol encouraged statin-use and the adoption of healthy lifestyle choices. This demonstrates how illness perceptions influence health behaviours. UK males mentioned that their desire to wade off the consequences of high cholesterol encouraged only the adoption of healthy lifestyle choices and not statin-use. This corresponds with the gender differences observed in the perceptions of statin-use discussed by UK participants i.e. all UK females portrayed statin-use in a positive light while some UK males discussed their general dislike for medication-use and preference for the adoption of healthy lifestyle choices. This will be further discussed under the control theme. Thus it follows that the perceived consequences of high cholesterol would encourage statin-use in UK females but not in UK males. This demonstrates how gender differences in control perceptions could influence health behaviours.

NG male 2 *“the consequences, if I am not mindful there are a lot of consequences if am not mindful... If I drink excessively, eh, if I don’t do exercise, if I don’t check my (stammers) levels of cholest (stammers), whatever, it can, you know, I must have to be very careful, I know my diet.*
Interviewer: What do you think can happen if you don’t?
NG male 2: *I could (stammers) stroked. God forbid. Eh if am not mindful, heart attack will come in”*

Several participants in both countries mentioned that they were unperturbed by the high cholesterol albeit for different reasons. Male participants in both countries illustrated how perceived control of high cholesterol could diminish the perceived consequences of high cholesterol and potentially hinder the adoption of healthy

lifestyle choices. Faith in God and fatalistic beliefs conferred a sense of control to Nigerian males. This appeared to diminish their perceived consequences and allowed them to externalise control of their cholesterol, potentially hindering the adoption of healthy lifestyle choices. This will be further discussed in the control theme under the sub-theme “*my confidence in my God*”. UK males demonstrated that perceived medical control of high cholesterol characterised by statin-use; not experiencing any problems related to high cholesterol and statin-use; and regular check-ups conferred a sense of control and prevented them from worrying about their high cholesterol. This could potentially hinder their adoption of healthy lifestyle choices. UK males also mentioned that understanding high cholesterol and statin-use gave them the assurance they needed to prevent them from worrying about their high cholesterol. This demonstrates how statin-use, perceived medical control and perceived understanding of high cholesterol could influence illness perceptions i.e. diminish the perceived consequences of high cholesterol potentially hindering the adoption of healthy lifestyle choices. The UK female who described herself as undisturbed by her high cholesterol explained that she did not perceive her high cholesterol as a serious health problem thus could not muster the willpower to adopt healthy lifestyle choices. All 3 of the reasons given for lack of concern about high cholesterol demonstrate how diminished perceptions of the consequences of high cholesterol could hinder the adoption of healthy lifestyle choices.

“I for one have never given a damn about cholesterol whatever. But unfortunately, I am diagnosed to have one and still am still not bothered so [pause].” NG male 1

“Em so I get my, my check-ups and everything and as part of it they do my cholesterol levels and all the rest of it. The one tablet seems to be keeping my cholesterol levels manageable...Without any great problem... And it's one of those things that I suppose I put to the back of my mind because I've been on it for quite a long time, with no ill effects at all” UK male couple 1

Theme 3: Cause

This theme captures information about the factors that participants believed caused their high cholesterol. It consists of 3 sub-themes, namely: genetic factors, lifestyle factors and unsure. Discussions about the cause of high cholesterol varied slightly between Nigerian and UK participants. The former attributed their high cholesterol to a sole factor i.e. either genetics or lifestyle, while the latter predominantly identified a combination of genetic factors and lifestyle factors to various degrees as the cause of their high cholesterol.

Sub-theme 1: Genetic factors

Only a few participants recruited from both countries attributed their high cholesterol to genetic factors. However, only 1 of these participants identified statin-use alone as a suitable control strategy. All other participants identified statin-use alongside the adoption of healthy lifestyle choices as a suitable control strategy but differed in their area of emphasis.

The Nigerian participants who attributed their high cholesterol to genetics, described genetics the sole cause of their high cholesterol and recounted their family history of high cholesterol and other cardiovascular disease risk factors. These participants emphasized the importance of adopting healthy lifestyle choices to control their high cholesterol. Their causal perceptions (genetics) do not appear to match their control perceptions (lifestyle factors). This illustrates an incongruous cause-control relationship. The Nigerian man who demonstrated these views was a statin user and was classified as an adopter of both a low-fat diet and healthy exercise behaviours. The Nigerian female who demonstrated these views was a non-statin user who was classified as a non-adopter of both health behaviours. The UK participant who identified genetics as the sole cause of his high cholesterol stated that he believed dietary factors played no role in causing or controlling his high cholesterol and identified statin-use alone as an appropriate control strategy. His causal perceptions (medical cause- genetics) and his control perceptions (medical control- statin use) mirror each other. This demonstrates a congruous cause-control relationship. Unsurprisingly, he was classified as a non-adopter of both a low-fat diet and healthy exercise behaviours in the UK quantitative study.

“I believe it was it could be a hereditary factor at that level, at that level cos at 30 I’m not supposed to have high cholesterol and be hypertensive. I know that my dad died of hypertension but at the age of sixty something ehh, but me it has shown clear that hereditary factor was into play and more so am not the first son. The first son, although hypertensive, the second son, third son, nai sixth, seven and I became hypertensive you see and I don’t know whether there is something we call mutation, a sudden change in gene, it could be as a result of mutation, I agree more so, for if there is a sudden change in gene anything can happen” **NG male 2**

“Em I would think it’s a, it’s a gen, genet, genetically inherited.....you would probably find that it almost certainly was genetically linked, the pre, that people have a pre-disposition to a high cholesterol level or they don’t!..and this is my personal view, I don’t think it’s dietary.” **UK male 1**

Interviewer: “Which do you think has more of an impact on your cholesterol? The statin or the lifestyle? Or do you think it’s a combined approach?”

UK male 1: *“Statin.Statin [pause]...I don’t think it’s a combined approach. That’s my view.”*

The participants who attributed their high cholesterol to genetics yet acknowledged the causal role of lifestyle factors such as poor diet and physical inactivity were recruited from the UK. They identified making healthy lifestyle changes alongside statin-use as an appropriate control strategy, but differed in their area of emphasis. The UK male who discussed this, emphasized the adoption of healthy lifestyle choices because he preferred to take matter into his own hands rather than rely on medication-use. This demonstrates a somewhat incongruous cause-control relationship. He was classified as an adopter of healthy exercise behaviours. The other UK participant who discussed this placed more emphasis on the statin-use. She recounted that her friend’s high cholesterol seemed to have been controlled by his statin and not his healthy diet. Her causal perceptions (predominantly genetic factors with a dietary influence) mirror her control perceptions (statin-use + dietary control with an emphasis on the former). This demonstrates a congruous cause-control relationship. She was classified as an adopter of both a low-fat diet and healthy exercise behaviours in the UK quantitative study.

UK male 3: *“I think it is hereditary, mine, yeah”*

Interviewer: “Do you think maybe aging or diet contributed in any way?”

UK male 3: *“Er, probably diet”*

Interviewer: “What do you put more of your faith in to, to help keep it low, your lifestyle or the tablet?”

UK male 3: *“Me lifestyle...I try to do something about it meself but er no as I am at the moment I feel fine”*

“I’ve got a couple of friends who eat absolutely wonderful diets. One’s a vegetarian and he eats no meat, he eats no fat at all other than cheese, and yet he had high cholesterol. Took his statins, and it’s now at a manageable level” **UK female 3**

Majority of the participants recruited from both countries that cited genetics as the sole cause or the main contributing factor to their high cholesterol, included lifestyle factors in their control strategies. This demonstrates an incongruous or somewhat incongruous cause-control relationship.

Sub-theme 2: Lifestyle factors

Majority of participants in both countries acknowledged the causal role of lifestyle factors on their high cholesterol. All participants who identified lifestyle factors as the sole cause of, or a contributing factor to their high cholesterol, identified the adoption of healthy lifestyle choices as the core, or a component of their control

strategy. The majority of these participants were classified as adopters of a low-fat diet and/or adopters of healthy exercise behaviours.

Most of the Nigerian participants cited lifestyle as the sole cause of their high cholesterol. However, only male participants discussed the role of physical inactivity. One of whom identified physical inactivity as the sole cause of his high cholesterol and cited increased physical activity as the sole factor that could rid him of his high cholesterol. Only one of these men was classified as an adopter of healthy exercise behaviours. On the other-hand, female participants in Nigeria did not acknowledge the role of physical inactivity on their high cholesterol. They identified dietary factors such as: the consumption of sugary foods and carbohydrates; consumption of fatty foods; eating late; and alcohol consumption to alleviate stress as the sole cause of their high cholesterol. They cited the adoption of health dietary behaviours as a suitable strategy to control their high cholesterol. This demonstrates a congruous relationship between perceived cause of high cholesterol and perceived control of high cholesterol. However, only some of these females were classified as adopters of a low-fat diet and/or healthy exercise behaviours.

“Yes! Exercise, yes. I want to, [pause] am a lazy person so I feel it’s because am lazy, I tend to have what people refer to as cholesterol. But if I was really active I don’t I don’t think It [high cholesterol] would really be a problem” NG male 1

*NG female 4: “What caused it is maybe too much of taking cholesterol, taking carbohydrates in excess, then maybe late eating”
Interviewer: Ok, so what do you do to control it?*

NG female 4: Number one, my carbohydrate aspect, I have to lower it, try to be taking fruit and vegetable. Then number two, if I can do some exercise to limit as in then if I want to eat in the evening, I will make sure I eat between 6 and 7. So that my digest, my digestive system will be ok, all my hormone will be circulate unlike before I used to eat like 10, 9 o’clock it depends on how eat then but now so that my body fit will be ok.

Most UK participants discussed the causal role of both lifestyle and genetics, yet cited lifestyle as the predominate cause of their high cholesterol. These participants generally identified both the adoption of healthy lifestyle choices and statin-use as a suitable strategy to control their high cholesterol. This demonstrated a congruous cause-control relationship (lifestyle cause with a genetic influence - lifestyle control alongside statin-use). Whilst this was the most common cause-control relationship in UK participants, there were 2 UK males who discussed placing more emphasis on one aspect of their control strategy. One of whom seemed to place more emphasis on statin-use. He explained that he believed he would always have to

take a statin regardless of how much he exercised. His causal perceptions (poor diet with an acknowledgement of genetics) and his control perceptions (lifestyle +statin-use with an emphasis on statin-use) seem somewhat incongruous in nature. This demonstrates a somewhat incongruous cause-control relationship. UK Male 2 on the other-hand seemed to place more emphasis on lifestyle control. His causal perceptions (poor diet +physical inactivity with an acknowledgement of genetics) and his control perceptions (lifestyle +statin-use with an emphasis on lifestyle control) demonstrate a congruous relationship between perceived cause and perceived control of high cholesterol. Both men were however classified in the UK quantitative study as adopters of both a low-fat diet and healthy exercise behaviours.

"I understand that you get high cholesterol through your lifestyle, ie. being overweight, possibly not very active, and also what you eat. Er [pause] whether it is a genetic thing or not, I don't really know because I have got a cousin who had terrific high cholesterol and had to go and be dealt with through the hospital. It'll be about ten years ago? And his brother had to be checked as well, so I don't know if it something genetic... I think it's possibly your lifestyle, the way you indulge and don't look after your body. That's what I understand anyway, that's what I feel... some people say cholesterol is also stress related. I don't know" UK female 1
"I treat statins as being a for life thing. And I never see a point where I won't be taking them irrespective of how much... exercise or anything else that I get now....I can't see me ever recovering to the point where I don't need a statin." UK male couple 1
"I think it's a combined effort from both, I would think it's come down quite a lot because of the diet and exercise, because I'm not putting anything in on a regular basis that I would think would collect cholesterol, but certainly the statin I think is making sure that it stays low. But as I say it'd be an interesting experiment to see what it would be like without the statin, but whether I'm prepared to do that is another question." UK male 2

Lifestyle factors, predominantly diet were the most common cause of high cholesterol discussed by participants recruited from both countries. Majority of these participants demonstrated congruous cause-control relationships and were classified as adopters of at least one of the healthy behaviours investigated in the quantitative studies. This demonstrates how illness perceptions i.e. cause-control perceptions could influence health behaviours i.e. statin-use and/or the adoption of healthy lifestyle choices.

Sub-theme 3: Unsure

A few UK participants mentioned that they were unsure of the cause of their high cholesterol thus demonstrated an undefined cause-control relationship. Most of

these participants stated that they were simply unsure of the role of genetics and questioned the influence of other cardiovascular disease risk factors, dietary factors and chance on their high cholesterol. These participants were classified as non-adopters of both a low-fat diet and healthy exercise behaviours. One of the participants who described himself as unsure of the cause of his high cholesterol explained that he did not think his cholesterol was high and felt he had been prescribed a statin because it was fashionable. He was classified as an adopter of a low-fat diet.

“I really don’t know. I don’t know whether it’s related to the diabetes, or whether it was just something that happens but it’s not something that my family have ever had. I’m a great fan of cheese in all its forms [laughing]. But other than that I don’t know, I wouldn’t have thought even I could eat enough cheese to drastically change. So I really don’t know. Things keep cropping up, and they’ll say ‘oh you’re diabetic’, and I don’t know whether that is a real reason or not but I accept it [laughs].” UK female 4

“I didn’t even know that I had high cholesterol, and I don’t actually know that I have because as I said to you earlier, I came to take a statin, I am not entirely sure it was because of high cholesterol because I don’t think it was. The sequence of events the sequence of events wasn’t such that I had a health incident or specific tests that I went back to the doctor for, this was just his annual review of my medication list. And in one year, I guess it might be 4 maybe 5 years ago, he said, ‘oh they are telling us now that statin is a good thing, so I am going to add a statin to your amlodipine and whatever else it was that I was on at the time, doxazosin and so to answer your question, what caused my high cholesterol I’ve really no idea, because my diet has never been that bad and it didn’t arise am not even sure I was taking it for high cholesterol, I thought I was actually taking it as part of this poly pill I don’t want to call it fashionable, but if you like, fashionable thing that was shown statistically to improve health generally.” UK male 4

Theme 4: Control

This theme captures the control beliefs of participants and descriptions of the changes they discussed making, or not making, in an attempt to control their high cholesterol. This theme consists of 4 sub-themes, namely: medical control; lifestyle control; no control; and *“my confidence in my God”*.

Sub-theme 1: Medical control

Discussions about medical control of high cholesterol differed among participants recruited from Nigeria and the UK. All of the UK participants voiced good statin control beliefs i.e. they believed their statin could control their high cholesterol. Even the UK participant who felt he was given a statin because it was fashionable

explained that although he did not associate his statin with high cholesterol, he did believe statin-use was beneficial for his overall health. Good statin control beliefs appeared to be fuelled by information garnered from the media, from doctors and from the confidence UK participants' expressed having in their doctors.

"I think a lot of people feel that doctors are issuing these tablets because they're getting paid to issue them... And a lot of people that I know feel that. I don't feel that, I sort of think well, I think I know the doctor well enough, he wouldn't give them to us just for the sake of 'Oh well I'm going to get an extra bob in the pot', or something. So you know, I don't look at it like that, I look at it that it's to help you with your general health" UK female 1

Majority of UK participants expressed the belief that statin-use worked alongside the adoption of healthy lifestyle choices. This illustrates a synchronous relationship between medical control (statin-use) and lifestyle control (the adoption of healthy lifestyle choices). Most of these participants were classified as adopters of a low-fat diet and/or healthy exercise behaviours. It is worth noting that this mirrors the finding that most UK participants cited a combination of genetics and lifestyle factors as the cause of their high cholesterol.

"I rely on the tablet to do its job, but I've realised the tablet can't do it on its own. I've got to have control of what's going in, my lifestyle, the tablet can only help me. I don't think it can cure it. It'll help, but also I think your lifestyle and the tablet work together." UK female 1
Interviewer: "So what do you think is making more of an impact on your cholesterol, keeping it stable? Or do you think it's all the walking you're doing and the healthy eating? Or do you think it's the Statin?"

UK female couple 2: "Hopefully it's a combination."

UK male couple 2: "Yes...Hopefully!"

Interviewer: Do you put more faith in one than the other?

UK male couple 2: "Not really. No."

UK female couple 2: "I don't think so"

Nigerian participants on the other-hand, voiced mixed statin control beliefs. Some Nigerian participants voiced good medical control beliefs, not just in relation to statin-use but also in relation to regular hospital visits and medical tests. Conversely, others voiced weak statin control beliefs fuelled by concerns about the side-effects of statin-use; dislike of lifelong medication-use; the belief that their high cholesterol was caused by lifestyle factors thus should be controlled by lifestyle factors and not statin-use (congruous lifestyle cause-control perceptions); and the belief that it was easier to adopt healthy dietary behaviours than take medication on a daily basis. Only 1 Nigerian participant expressed strong statin control beliefs alongside strong lifestyle control beliefs i.e. a synchronous medical-lifestyle control

relationship and he was classified as an adopter of both a low-fat diet and healthy exercise behaviours. This mirrors the finding that majority of Nigerian participants identified either genetics or lifestyle factors as the sole cause of their high cholesterol.

“You know the most important thing is to come to the hospital for regular check it because when it is discovered that you have that [high cholesterol], you could be placed on drug because you know to me simtab [simvastatin] is very good, it’s the best and can lower the cholesterol in diabetic patients and regular check-up too. Checking your urine and all those things and doing blood sugar helps too” **NG female 5**

“I don’t want to be on life medication, three years is ok, everyday three years, no, it’s going to do my liver in” **NG female 6**

“I think the drug thing for cholesterol is not really it, it’s more like its activity that really counts. So if you tend to consume more or your consuming foods with high whatever, I think if you walk if you walk, if the activity is increased you will be able, you will be fine” **NG male 1**

Female participants in both countries depicted statin-use more positively than males. Females in the UK went a step further and described statin-use as easy and automatic. Statin-use was positively perceived by some females recruited from both countries partly because they perceived themselves as unable or struggling to adopt healthy lifestyle choices and perceived statin-use as an easier alternative. Thus their positive perception of statin-use is in part due to their perceived lack of agency which will be further discussed under the theme *“I just chose”*.

“Well I was already taking insulin, so it was just part of the bedtime routine. You know you have your injections, you take your statin [pause], clean your teeth, go to bed, so no, for me it was no big problem... You know it’s just one of those things. You take them; they’re no effort to take” **UK female 3**

Although females generally perceived statins more positively than males, some Nigerian females cited concerns about side-effects as a reason for their weak statin control beliefs and preference for adopting healthy lifestyle choices. This contrasts with the narrative of UK females who recounted experiencing side-effects and demonstrated an awareness of the controversy around statin-use but explained that they persevered with statin-use because they believed it was beneficial for cardiovascular disease prevention and for their overall health. This illustrates how perceived consequences of high cholesterol could encourage statin-use as was previously discussed under the consequences theme.

“If I can see medication that I will take that will not have another effect on me I can take it” **NG female 4**

*“I wasn't too happy to be put on simvastatin because that's the cheaper bog-standard one cos I did get a lot of muscle pains and things like that at first... But I mean to be quite honest I've stuck with it, and I don't get pains anymore... I think you can also get side effects of sleep patterns as well, and erm...but I've never slept particularly well, so the muscle pain did put me off a bit... But I've stuck with it, and I think the benefits for me, I think that if it's going to prevent me having a stroke or a heart attack because as I say, there's a history of high blood pressure in my family I've a couple of relatives on both sides – my mother's side, who have died as a result of stroke. So, including my grandmother, so really you know, that does say to me you know, that yeah there is a risk there and that I should take it.” **UK female 5***

Some of the male participants in both countries expressed their general dislike for medication-use claiming that they did not need medications and would rather do what they could to control their health problems. This preference for adopting healthy lifestyle choices appears to be linked to the sense of agency most males from both countries recounted having which will be further discussed under the theme *“I just chose”*. Nevertheless, they cited statin-use as a component of their strategies to control their high cholesterol. One UK male disagreed with the aversion to medication-use specifying that he did not have a problem with medication-use. It is worth noting that his wife was diagnosed with multiple sclerosis. He also mentioned that he was an active member of the local support group for people with multiple sclerosis and he discussed researching various therapeutic options for his wife. Consequently, he may have a greater medicalised perception of illness than the other male participants and would not share their aversion to medication-use. It also follows that despite attributing his high cholesterol to poor diet and citing a combined control approach of both lifestyle and statin-use, he placed greater importance on the use of statins to control his high cholesterol. This illustrates how social role (husband of chronically ill female) may influence illness perceptions and subsequent health behaviour.

*“Personally, I don't, I hate drugs personally, I most times I'd rather feel ill and get over it without the medication. Without any sort of medication. I just believe when you're ill it's a time and [pause] your body fights it and it's out” **NG male 1***

*“I don't take pills sorry, I can't think, well actually I can think because I've just had flu and I have had to take some Panadols or whatever, but I go from one year to another without taking any kind of, I've even forgotten what they are called now, paracetamols or anything like that. I do not believe in fundamentally I do not believe in taking pills for things that are, that are controllable myself... I have never been one for, masking symptoms, so I would rather see to it myself than rely on you know.” **UK male 4***

*“There’s always research. There’s always some fantastic new super drug which is going to be the be all and end all and after a year or so, it all fizzled out and you never hear anything more of it... Statins are here to stay. I can, I, that I do know.” **UK male couple 1***

In addition to demonstrating a synchronous medical-lifestyle control relationship, participants in both countries also demonstrated an antagonistic relationship between statin-use and the adoption of healthy lifestyle choices in both directions. Some participants voiced good statin control beliefs alongside weak lifestyle control beliefs. This illustrates an antagonistic relationship between statin-use and the adoption of healthy lifestyle choices that favours statin-use. All but 1 of the participants who voiced this relationship were females. This corresponds with the finding that females depicted statin-use more positively than males. The females who voiced a preference for statin-use explained that they perceived themselves as unable to adopt healthy lifestyle choices due to a weak sense of agency; pleasure derived from eating; and competing priorities. Statin-use in this scenario was portrayed as an easier alternative to the adoption of healthy lifestyle choices. The only male participant who demonstrated this relationship explained that he believed his high cholesterol was caused by genetic factors and thus could only be controlled by statin-use. He emphasized his belief that lifestyle factors played no role in causing or controlling his high cholesterol (congruous medical cause-control relationship). All of the participants who demonstrated an antagonistic relationship between medical control and lifestyle control that favoured the former were classified as non-adopters of both a low-fat diet and healthy exercise behaviours. This demonstrates how statin-use may hinder the adoption of healthy lifestyle.

*“I have to take the best part of it first as the person who owns this pot, so tell me how will I trim [laughter] unless I come to the hospital [louder laughter] do series of tests so I will be placed on simtab [simvastatin] to help me to eliminate the cholesterol in me [laughter], it’s not easy.” **NG female 5***

Interviewer: Do you have more faith in one in terms of controlling your cholesterol? The diet or the exercise or the statin?

***UK female 4:** The statin! [laughs]. I don’t know, I suppose you think it’s an easy fix. It doesn’t really involve much effort apart from remembering to take it.*

Some participants in both countries demonstrated an antagonistic relationship between statin-use and the adoption of healthy lifestyle choices that favoured the latter. Most of the UK males who voiced a general dislike for medication-use and a proclivity to take matters into their own hands demonstrated this relationship. Majority of these men were classified as adopters of a low-fat diet and/or healthy exercise behaviours. The male participant in the Nigeria study who demonstrated a

preference for the adoption of healthy lifestyle choices over statin-use cited this as well as his belief that high cholesterol was caused by physical inactivity and thus control by physical activity not statin-use (congruous lifestyle cause-control relationship). However, he was classified as a non-adopter of both a low-fat diet and healthy exercise behaviours. Females in the Nigeria study who voiced strong lifestyle control beliefs alongside weak statin control beliefs because of their concerns about side-effects and lifelong use of medication also demonstrated an antagonistic medical-lifestyle control relationship that favoured the latter. All of these females were classified as adopters of a low-fat diet and/or adopters of healthy exercise behaviours.

Sub-theme 2: Lifestyle control

This sub-theme captures descriptions of the lifestyle changes participants discussed making or not making. It also contains information about the perceived benefits of and barriers to the adoption of healthy lifestyle choices mentioned by participants. Majority of participants recruited from both countries discussed making dietary changes such as: limiting fat consumption; using low-fat substitutes; avoiding frying; reducing fast food consumption; reducing salt intake; increasing vegetable consumption; reducing consumption of carbohydrates and sugary foods; changes to meal times; improving food purchasing behaviours; portion control; checking nutrition labels on food items; reducing alcohol consumption; and smoking cessation.

*“So just to know what to take in, like drink, like soft drink, you have to limit it because it contains a lot of sugar and oil there are some oil that contain, that doesn't even have cholesterol, so if I can be using it to cook to eat it, limit my oil and butter at least it will control it..... Like before I used to eat three times, there are times I used to eat carbohydrates like gari¹, I used to eat it in the night, so if I can stop it, avoid it, maybe if I feel like eating something in the evening, after eating it, I can take fruit, so I will make sure that vegetable is plenty in what am eating” **NG female 4***

*“not eating quite as much, and the only oils I ever have I have cold pressed rapeseed oil and cold pressed olive oil...but it's just a case of cutting down on any fat at all for me, but when you do have any fat make sure that it's a good fat, and control the portion size... no matter what you eat if you eat too much of it it adds up.” **UK male 2***

Some of the male participants recruited from both countries mentioned that they had not intentionally made any changes to their dietary behaviours because they

¹ A meal made from Cassava

did not believe they needed to make any changes. The Nigerian male who discussed this explained that he did not make any dietary changes because he did not feel his dietary behaviours required any modifications. This is consistent with his attribution of high cholesterol to physical inactivity and not dietary behaviours and demonstrates the influence of cause-control perceptions on adoption of healthy lifestyle choices. This participant was classified as a non-adopter of both behaviours. This was previously discussed under the cause theme. The UK males who specifically stated that they had not made any dietary changes described their diets as healthy and explained that their taste in food steered them towards healthy foods thus they did not need to consciously adopt a low-fat or healthy diet as they did so naturally. This will be further discussed under the theme “*I just chose*”. Interestingly, 1 of the men who discussed this was classified as a non-adopter of a low-fat diet (UK male 1), while the other was classified as an adopter of a low-fat diet (UK male 4) as shown in Table 6.3.

“I have never had a particularly high fat diet, so do I slavishly say no I can’t eat that because it is high fat? No...I can’t honestly say that there was anything that I thought ooo I really need to cut that out.”

Male 4

Most participants recruited from both countries discussed making more dietary changes than exercise changes and more UK participants described adopting healthy exercise behaviours than Nigerian participants. Very few Nigerian females mentioned making any changes to their exercise behaviours. This corresponds with the finding that Nigerian females cited diet not physical inactivity as the lifestyle cause of their high cholesterol. The most common form of exercise described by participants recruited from both countries was walking. Nigerian participants mainly discussed taking part in outdoor forms of exercise such as walking, skipping or running. However, the Nigerian female recruited from the urban site did mention using a treadmill and swimming. UK participants described engaging in outdoor forms of exercise as well as exercises performed in a gym.

“Maybe skipping, running, you understand, anything I will do so that heat will come out from my body, that is why don’t, like this thing now.... I don’t like staying at home, as I eat in the morning, I will be sleeping, because no we have not started working again so I don’t like, I like maybe walking” **NG female 3**

The types of exercise UK participants discussed engaging in differed by gender. UK males mentioned engaging in individual activities such as swimming, playing golf and gardening. UK females described attending Zumba and yoga classes which are group activities. This reflects the desire for group membership expressed by

female participants and the deviation from group membership voiced by males which will be further discussed under the theme “*the whole world*”. Both genders also mentioned using the gym, however the types of activities they engaged in differed. UK males recounted engaging in more vigorous activities such as using cardio-machines, weightlifting and doing strength exercises such as crunches; while UK females mentioned using treadmills and seemed to describe a less vigorous level of intensity than their male counterparts.

“I go on a machine, I think they call it heart machine now, which it pumps your heart, and I do 20 minutes on that, then I go and do a few weights and then I go on another thing called an air stepper which they say is the harder machine in the place and I do 20 minutes” **UK male 2**

“I have a treadmill in the garage yes, which I use, and I do a lot of walking and my daughter has got a dog and I often go for a three mile trek with her...I try 40 minutes a day on the walking machine”
UK female 2

In addition to differing in the types of exercise they engaged in, UK participants also differed in their preference for diet vs exercise. UK males stated a preference for making health dietary changes while UK females stated a preference for making healthy exercise changes. UK males explained that they found it easier to make healthy dietary changes because they believed their diets were relatively healthy thus required less modification and because they had not previously been physically active and were too lazy to adopt healthy exercise behaviours. However, 2 UK males disagreed with this citing healthy exercise changes as easier to adopt than healthy dietary changes. Only one of these males was classified as an adopter of healthy exercise changes. UK females explained that they found it easier to make healthy exercise changes because they found exercise more enjoyable and easier to adhere to and because they did not like having dietary restrictions.

UK male 4: *“if I was scoring it I’d say my diet is probably 7 or 8 out of 10 but my exercise is 4 or 5, so I’d say that’s the kind of, if I’ve got a weakness in my regime it is the exercise. I am below average, I am below what I should be on that one.”*

Interviewer: “So you find the eating healthily bit easy to do?”

UK male 4: *“Oh that is no problem at all because I genuinely always have and therefore over the years the modification has been small”.*

Interviewer: “Do you find it easier to do the exercise or do the diet or are they about the same?”

UK female 2: *“About the same really. I prefer to exercise than diet.”*

Interviewer: “Really?”

UK female 2: *“Yes...Well I like a nice meal, so I hate thinking oh I can't eat that cause it's too fattening.”*

Unlike UK females who voiced a preference for making healthy exercise changes, only a few Nigerian females discussed making healthy exercise changes. Furthermore, they identified more barriers to making healthy exercise changes than they did barriers to making healthy dietary choices. In fact one participant questioned the benefits of exercise on improving ones health because she believed that exercise could cause more harm than good.

NG female 3: *“Exercise can't Medication is good, dieting is good. Exercise is not all that good for them [cardiovascular disease risk factors].”*

Interviewer: “You think so?”

NG female 3: *“I think so now. Cos your health does not need something that will really stress them o that is what I think o. Because hmmm exercise... maybe one day you can find out doing exercise maybe by the time you know, maybe thinking or doing whatever, your BP will be high, it can just affect you.”*

Despite discussing a preference for diet vs exercise, all participants recruited from Nigeria and the UK identified various benefits of adopting healthy lifestyle choices. These benefits clustered into 3 categories, namely: medical factors, personal factors and social factors. The medical benefits discussed by participants recruited from both countries were improved health, fitness and mobility. UK participants also cited feeling good and improved quality of sleep as medical benefits of the adoption of healthy lifestyle choices. The personal benefits cited by all participants (Nigeria and UK) was improved body image. This will be further discussed under the theme *“I just chose”*. Only UK participants cited an opportunity to meet new people as a social benefits of adopting healthy lifestyle choices. This will be further discussed under the theme *“the whole world”*. Nigerian participants did not cite a social benefit of adopting healthy lifestyle choices. This may suggest that the adoption of healthy lifestyle choices is not perceived to have any social benefits by Nigerian participants.

“Well I know the exercise has made me fitter and I have lost weight so hopefully that does something to the cholesterol too I haven't checked..... am in better health, I can walk better without panting, so am a lot fitter” **NG female 6**

“The benefits are phenomenal, as I said I've never felt as good, I really feel fabulous, I feel as if I've got energy.” **UK male 2**

“I've lost quite a lot of weight, and I feel that's done me the world of good. I think it helps your joints as well, if they don't...not that they ache, but they work better.” **UK female 3**

All participants recruited from Nigeria and the UK identified various barriers to the adoption healthy lifestyle choices which clustered into 3 categories, namely: medical factors, personal factors and social factors. Nigerian males discussed no medical barriers to the adoption of healthy lifestyle choices. All other participants described body pains and injuries as medical factors that hindered the adoption of healthy lifestyle choices. Physical limitations of diabetes and physical limitations of ageing were also cited by Nigerian females and UK participants respectively. The personal and social factors identified by participants as barriers to the adoption of healthy lifestyle choices will be discussed under the themes “*I just chose*” and “*the whole world*”.

“to me as a diabetic patient, you find it difficult to go for exercise” **NG female 1**

“I used to swim a lot, but my shoulders became very...not broken, but they ached a lot and I had a lot of problems. And it was the swimming that was doing it and I couldn’t change stroke. So I don’t swim now” **UK female 3**

“I certainly exercise a lot more now than I have ever done in my life, but the intensity of exercise is probably not as much as if were 27 rather than 67, I think that’s the difference, I’d like it to be as I was 27 but I accept that you know there’s a point at which I have to accept that, you know...I think your body needs a rest in between at my age, I think maybe when you’re younger you can do it [go to they gym] every day, but not, you know, if I do do it two or three day consecutively I do find that the amount of exercise gets less per day that I can actually manage so I think well something is telling me inside quit while you’re in front, so I think that’s one issue, but it would be nice to be able to do a bit more” **UK male 2**

Sub-theme 3: No control

This sub-theme captures participants’ account of not attempting to control their high cholesterol. No control attempt was only discussed by 2 participants recruited from Nigeria and seemed to be linked to the agency. The male participant who discussed this, emphasized the role of his agency and his choice in the management of his high cholesterol. He stated that he had not made lifestyle changes because he did not want to, and did not feel the need to. This will be discussed further under the theme “*I just chose*”. The female participant who discussed not attempting to control her high cholesterol, discussed being unable to make lifestyle changes because she had a hectic work schedule which she could not control i.e. lack of agency. She mentioned that retirement from work had afforded her the time to make the necessary lifestyle changes and adopt healthier diet and exercise behaviours.

NG male 1: I have never tried to [control high cholesterol], but I have just been having talks about it but I have never tried to control it.

Interviewer: Why haven't you ever tried?

NG male 1: *Cause I like what I do, I like how I have been and nobody has the right to complain to me cause it's my body"*

"To control it, [laughs] I didn't. I just left the job so no wahala² now. So that [inaudible] to get rid of it, I didn't, the stress went on for years, that one was gradual, that one was like over three years or something like that" NG female 6

Sub-theme 4: "my confidence in my God"

This sub-theme was only discussed by participants recruited from Nigeria. It captures the way participants described events beyond their control, as a result of predestination or due to the involvement of God. Beliefs about predestination and God are personal beliefs that may have been influenced by the social world of study participants. However, as these beliefs are a sub-theme of the control of the high cholesterol theme, and for an uninterrupted read, they will be discussed under the medical world of high cholesterol.

Mutual to all Nigerian participants was the belief in forces greater than themselves that had the ability to impact upon life. All 8 of the participants recruited from Nigeria either expressed fatalistic beliefs or discussed the role of God. Fatalistic beliefs allowed both genders to externalise control of their high cholesterol and appeared to hinder the adoption of healthy lifestyle choices. Participants who expressed fatalistic beliefs, described life as unpredictable and this seemed to some extent to negate the concept of control. One of the participants who expressed these fatalistic beliefs explained that he had known overweight people who had lived long lives thus was bemused that his doctor was concerned about his high cholesterol. On the other end of the spectrum, another participant who expressed fatalistic beliefs recounted how the sudden death of both her parents led her to decide to enjoy her life because life was so unpredictable. She narrated how she began to eat and live as she wanted and believed this lifestyle had led to her weight gain. Both of these instances demonstrate how fatalistic beliefs enabled participants to externalise control of their high cholesterol, potentially hindering the adoption of healthy lifestyle choices.

"But I don't think it's a fuss, cause I think there are lot of overweight people who probably stayed longer than people who are presumed healthy or whatever. So...Lived longer rather so [pause]" NG male 1
"my father was not around, my mother too, all of them bereaved. So I was bereaved, I said agh agh, you see so now anything I see, I'll eat. Then, too I just started having a boyfriend, so you know you will

² A Pidgin English word for trouble/stress.

be hiding from your mum, so when she died, I just said hmm, this world, this world is not easy o, so at least you flex around [slang for enjoy or sleep around], go out, ice cream, whatever, you eat, by the time you know I had started getting fatter fatter fatter, so I don't really know" NG female 3

Nigerian participants also discussed their belief in God. The way this influenced lifestyle behaviours appeared to differ by gender. One male participant described how his faith in God made him confident that his high cholesterol would not lead to cardiovascular disease or death. This demonstrates how beliefs in God could diminish perceived consequences of high cholesterol and allow for the externalisation of control potentially hindering the adoption of healthy lifestyle choices. However, Nigerian females discussed their belief in God in terms of prayer, and described using prayer alongside lifestyle and/or medical control of high cholesterol. Thus their belief in God did not appear to hinder the adoption of healthy lifestyle choices, rather it appeared to work alongside medical and/or lifestyle control of high cholesterol.

"why I have confidence that my medication will actually help is coupled with my exercise, knowing my diet eh, it will take a very long time, it will really take a long time, even though it may occur, am mentioning probability, it may, it may not, it might not really be really be stroke, heart whatever or hypertension that might kill me. Right now as I live am living, even if I fly anything can happen, even if am driving anything can still happen, will it be hypertension or high cholesterol that will kill me? And I tell you frankly, I bet you and I cross my hands, these thing will not kill me. It's my confidence in my God I will die but as so far as am living, it be won't hypertension or high cholesterol" NG male 2

"I can pray, I will pray normal, but this prayer point is not that maybe its spiritual something, this is what you are taking in, it's not something, it depends on how you can control your diet in eating aspect. So it's not about prayer matter, it's not about spiritual something. So just to know what to take in" NG female 4

"Prayer too hmm is important, but you know even if you pray and you continue it's still the same, so its better you come to the hospital" NG female 5

Theme 5: "I just chose"

This theme describes the personal factors participants cited as either barriers to, benefits of, or facilitators of the adoption of healthy dietary and exercise behaviours. The personal factors that influenced the adoption of healthy lifestyle choices discussed by study participants (Nigeria and UK) appeared to differ by gender. Male participants recruited from both countries predominantly described their sense of agency as the main factor that influenced their adoption of healthy lifestyle choices. This will be discussed under the sub-theme "*I choose to do what I want to*

do". Female participants in both countries described body image concerns as the main personal factor that influenced their adoption of healthy lifestyle choices albeit in opposite directions. This will be discussed under the sub-theme "not that slim o" vs "beautiful slim 12-14".

Sub-theme 1: "I choose to do what I want to do"

All participants described their agency or lack thereof as a personal factor that influenced their adoption of healthy lifestyle choices. Majority of male participants recruited from Nigeria and the UK expressed their agency to influence their health behaviours and adopt healthy lifestyle choices if they so desired regardless of any social pressures exerted on them. UK male participants described the ability to say no as crucial facilitator of the adoption of healthy lifestyle choices and emphasized that even when eating out or whilst away on holiday, they still ensured that they ate healthy meals. This illustrates how a sense of agency could encourage the adoption of healthy lifestyle choices.

"And to be honest, (sighs) it's a bit selective, I would only want to go where I would want to eat! So if somebody said to me we're going off to some greasy spoon... em well I would say not with me you're not! So em [pause] em [pause] no I, I would always want to, I would always, I would only go where I knew I was going to enjoy the food!"
UK male 1

One the Nigerian men emphasized that in addition to having the ability to adopt change his health behaviours he also had the choice to decide whether he should or should not adopt healthy lifestyle choices. He explained that he was happy in his current state and did not feel the need to make any lifestyle changes. He was classified as a non-adopter of both a low-fat diet and healthy exercise choices. This demonstrates how perceived agency could potentially hinder the adoption of healthy lifestyle choices.

"If you choose to be who you want to be or whatever weight or whatever whatever whatever you want, it's up to you. But I believe if I want to be overweight and I eat a lot because I have a high appetite, I would not stop because of so called cholesterol...if you feel uncomfortable, you should do something about it [high cholesterol]"
NG male 1

In addition to discussing their agency to influence their health behaviours, majority of male participants (Nigerian and UK) described their ability to influence the behaviours of others in their social worlds. One of the Nigerian men recounted his ability to engage with health care professionals and influence his treatment plan. UK males discussed their ability to influence the health behaviours of their friends,

wives and children. This will be further discussed in the theme “*The whole world*” under the sub-theme “*we have a compromise with the milk*”.

“You know [stammers] once you know your right you don’t allow someone intimidate you. When I started talking, he [the doctor] admired me and I said but am learned a master’s degree holder, you feel am not learned? So he really had to school me and he also told me of some implications and why he would change some drugs, and I now told him no why you must not change this drug. I argued them [stammers]. Because I know” **NG male 2**

The sense of agency voiced by UK male participants appeared to be fuelled by their belief that they were in charge of their lives and possessed the knowledge and income to be the drivers of their behaviours and lives. This demonstrates how knowledge and income may empower individuals and encourage the adoption of healthy lifestyle choices. This contrast with the perspective of Nigerian males who as previously mentioned under the sub-theme “*my confidence in my God*” of the control theme, appeared to externalise control of their high cholesterol to factors such as fatalism and God, over which they had no control.

“And of course because we’re bio-chemists we know if we eat an orange or whatever it is [pause] we know what’s in there Yes [pause]It, it’s, it’s part of what’s up here [points at head].” **UK male 1**

Perceived agency to influence health behaviours seemed to go a step further in UK males than in Nigerian males and seemed to fuel or be fuelled by a continuous search for improvement in a bid to improve overall health. Unlike Nigerian males, UK males not only described themselves as able to adopt healthy lifestyle choices but also recounted using various tools such as food diaries and step counters to set, monitor and constantly readjust targets such as BMI; fat and muscle percentage; exercise; weight; and clothing size. This difference between Nigerian and UK males seems consistent with the finding that the latter described themselves as in control of their lives and behaviours whilst the former appeared to some extent to externalize control of their high cholesterol. Consequently, they may have perceived less benefits of monitoring and setting targets to improve their overall health.

“I’m now discharged from there [Rotherham Institute for Obesity-RIO]but they allow me to go in and get weighed, and measured, so I went a week ago or so, and the difference is [points to figures in RIO statistics book]... I’m a born administrator I think, I like things in boxes... I like things compartmentalised, so I like to see, that encourages me because if I go off the rails I look at this [RIO statistics book]and I think I don’t want to be that or I don’t want to be

this, you know, and it keeps me focussed on what I want to do” UK male 2

The predominant male narrative was that men perceived themselves as able to adopt healthy lifestyle choices if they so desired. Less commonly discussed was the struggle to adopt a healthy lifestyle because of the desire to indulge in dietary treats. They referred to this as a “see food diet”. It should be noted that this was only discussed by UK males who were interviewed with their wives. Thus these males may not have been able to voice a strong sense of agency because their wives were on-hand to disagree with them. This was not the case for the other male participants who were not interviewed with their wives.

UK male couple 1: “The only way [pause] for me [pause] to not do it, is to not have the food in the house! If it, if it’s in the house”

UK female couple 1: He will eat it!

UK male couple 1: “It’s there in my mind! And I’ll eat it [pause] but if it’s not in the house [pause] then you know [pause] we shop once a week as a rule [pause] I do, I plan a menu for the forthcoming week and I buy the food for that menu for the week, roughly speaking. Em [pause] and as long as I do that and, and don’t go buying [pause] I, I made a mistake the other day! Kit Kats were 8 for the price of 4! [pause] Em now I was going to buy a couple of Kit Kats so I finished up buying this pack of 8 Kit Kats and I ate the whole damn lot in a week! “

Majority of female participants recruited from both Nigerian and the UK did not echo the strong of agency voiced by their male counterparts. Rather, they discussed struggling to give-up their dietary treats such as chocolate; cheese; alcohol; bacon; and fish and chips. UK females also described emotions such as anxiety and boredom as facilitators of comfort eating that hindered the adoption of healthy dietary behaviours. Nigerian females discussed feeling obligated or compelled to adhere to statin-use and to adopt healthy lifestyle choices because it was prescribed by a doctor and because it was for their own good.

“I do like a glass of wine...about a month ago I went to see the diabetic nurse and she said try to not drink as much and I said well I’m 72 nearly, and this is one of the pleasures in life, so, I don’t go mad but I do like to sit at night and have a little gin and tonic or a glass of wine, sorry but I do [laughs].” UK female 2

“they [doctors] will now give you some medications and its good you have to take it because it’s for your own good...Eh, like you have to try, you try your medications...I have to take my medication because it is being prescribed by a doctor to take” NG female 1.

It should be noted that male participants recruited from both countries demonstrated a can-do attitude. UK females predominantly demonstrated a don’t-feel-like attitude and Nigerian females demonstrated a should-do attitude.

Furthermore, unique to UK participants (males and females) was the discussion of a want-to attitude. UK participants articulated how their personal preferences for certain dietary and exercise behaviours influenced their adoption of healthy lifestyle choices. UK participants who discussed enjoying exercise described this as a facilitator for the adoption of healthy exercise behaviours. UK females expanded on this by explaining how their personal preferences influenced the types of physical activity they engaged in. UK males discussed their personal preferences more in relations to dietary behaviours than exercise behaviours, while the reverse was the case in UK females. This is consistent with the preference for making healthy dietary changes expressed by UK males and the preference for making healthy exercise changes voiced by UK females.

“Erm...I’ve never been a sporty person in that respect. I do like walking, living right on the edge here we do go walking... walking would tend to be my first response. I don’t like driving much. If I could walk rather than drive I will. I’ve a very good bus service. But walking I like.” UK female 4

“It’s a bit arrogant but our tastes are at the top end. And we can afford it! So for example, em if we’re in London or Hong Kong, we would go to some very, very good restaurants. And there [pause] our [pause] our, what we’re looking for is flavours. How good is the chef? How has he put these things together? Em, em that’s clever! And we never thought that would go with that. I mean both of us are quite good cooks so cooking is a hobby!...we want our food to taste. Taste is by far the most important. Em [pause] and generally if you’re cooking that style, you’re not cooking with a lot of junk food!” UK male 1

Sub-theme 2: “not that slim o” vs “beautiful slim 12-14”

Females recruited from both countries described body image concerns as the main personal factor that both encouraged and hindered their adoption of healthy lifestyle choices. However, females recruited from both countries differed in their preferred body sizes. The predominant narrative from Nigerian females was that did not want to be too slim i.e. they demonstrated a preference for plumpness. The predominant narrative from UK females was that they had preference for slimness. This reflects the different body image ideals in both countries.

The main narrative from Nigerian females’ i.e. a preference for plumpness could potentially hinder the adoption of healthy lifestyle choices. However, these women also described themselves as fat/heavy/healthy and mentioned that they wanted to trim down or maintain their weight and their current fitness level. This appeared to encourage the adoption of healthy lifestyle choices to some extent. However, there was clear emphasis on not wanting to be too slim and this seemed to be driven in

part by the negative way slimness was perceived by the others in their social world. This illustrates how body image ideals and the opinions of others could hinder the adoption of healthy lifestyle choices. The body image concerns of Nigerian female participants will be further discussed under the analysis of body image discourse presented later on in this chapter. The role of the opinions of the other members in one's social world will be further discussed under the theme "*the whole world*".

"Like my family, we are fond of being fat...I just want to trim down cos I know am on the fatty side that is why I just have to maintain myself for now ... am not on the slim side, if I want to go down, not all that slimmy" **NG female 3**

The main narrative from UK females demonstrated a preference for slimness. These females described their weight aspirations and successes in terms of clothing and dress-sizes. Going down a dress-size was described as a thing of joy, while going up a dress-size was depicted as a source of disappointment. Thus, the desire to lose weight encouraged the adoption of healthy lifestyle choices. UK females also mentioned that losing weight made them feel better; made them proud of themselves and their weight loss achievement; made them feel more confident about their bodies and themselves; and improved the way they were perceived by others. The latter illustrates how the perceptions of others could encourage or reinforce the preference for a slim body type and facilitate the adoption of healthy lifestyle choices. This will be further discussed under the theme "*the whole world*".

"So I've gone from a size 20/22 to a 14..., I'm afraid I'm a bit superficial I think, and it's all about thinking well I really want to look my best, and I really don't want to be the size I was, and I want to be able to wear nice clothes, and I want to be able to walk in to a shop and buy fashionable jeans and wear whatever I want to wear. So it was really quite superficial...I want to get down to a size 12 now."
UK female 5

"I have to buy some new jeans and that really upset me having to buy new jeans because I couldn't do up the zip on the others because I'm quite fat on the belly!" **UK female 4**

Less commonly discussed by UK females was the influence of body image on hindering the adoption of healthy lifestyle choices. Some UK females mentioned that negative perceptions of physical appearance and low self-esteem acted as a barriers to the adoption of healthy lifestyle choices. This highlights how body image concerns may hinder the adoption of healthy lifestyle choices.

"I love swimming, but I haven't got the confidence to go.... but I would love to go back to swimming, but I've got a long way to go before I go back to swimming I'm afraid" **UK female 1**

Body image was briefly mentioned by a few UK males. Some UK males explained that they would like to improve their physical appearance and discussed setting themselves target weights. They also described their weight successes in terms of clothing sizes i.e. in terms of neck sizes and waist sizes. One participant claimed that he set his weight targets to spare himself the expense of having to buy new clothes. His wife however disagreed with this, claiming that he did so out of vanity.

UK male couple 1: *"I genuinely think if I was on my own, it would probably be, I'd probably be an awful lot worse than I am. I'll own up to that! Em I'd probably eat a lot of, more rubbish than I do. But having got into... this idea of ... as I say, keep trying to aim at keeping myself at about 11 stone... I know that if I start eating the rubbish that I used to eat... then it's piled back on again!"*

Interviewer: Did you give yourself that aim?

UK male couple 1: *(Pauses)... what to keep at 11 stones?*

Interviewer: Yes.

UK male couple 1: Yes.

Interviewer: May I ask why?

UK male couple 1: Yes got another cruise booked!

UK female couple 1: Cos he's quite vain!

UK male couple 1: ...No! *(Laughs)* We've got another cruise booked for July... and... em it's the same thing, I want to keep down to the 11 stone mark roughly speaking. Because then I know that all my clothes, all my... black tie, night stuff and all the rest of it, all my dress shirts will still fit me! ... Perhaps it's just that I'm miserly and I don't want to buy a new wardrobe of clothes!.. But no I, I wouldn't say I'm particularly vain but... I must admit I'm... em. I dislike to see people who are obese

Theme 6: "The whole world"

This theme describes the social factors participants cited as either barriers to, benefits of, or facilitators of the adoption of healthy dietary and exercise behaviours. The social factors that influenced the adoption of healthy lifestyle choices were aspects of the social environment of participants, this will be discussed under the sub-theme "*I don't like ice*" and the social roles participants engaged in, which will be discussed under the sub-theme "*we have a compromise with the milk*".

Sub-theme 1: "I don't like ice"

The influence of the components of the social environment of participants such as scenery, weather, the holiday season and the increased availability of resources that facilitate the adoption of a low-fat diet and healthy exercise behaviours were only discussed by UK participants. They cited nice scenery as a facilitator of healthy exercise behaviours. Poor weather conditions, particularly ice, was described as a hindrance to the adoption of healthy exercise behaviours because participants were

concerned about falling and incurring physical injury. The latter was the most common barrier to the adoption of healthy exercise behaviours described by all UK participants.

“When I’d finished at one o’clock the snow was falling, and it was disgusting walking. Now if I’d wanted to go out for a walk and the weather had been like that, it wouldn’t have taken much to put me off and say ‘Oh no, I’ll go another time’. So I think just every day, not sort of special exercise, but everyday life when it’s cold and when the weather’s miserable becomes more difficult. And especially as you get older I think you worry more about black ice, or falling over and things like that.” **UK female 3**

“The other thing which I don’t do as much as I could and should is say just walking I mean, never mind the sort of formal exercise at the gym and that I know what’s sort of put me out of that, I’ve had both my hips replaced and I hate it, the one thing that is brilliant, but if its icy I won’t go out because I do not want to fall” **UK male 4**

UK participants also discussed the role of holiday seasons on their adoption of healthy lifestyle choices. They cited Christmas as a hindrance to the adoption of healthy lifestyle choices. UK females went further and explained that during the Christmas season they wanted to indulge in their dietary treats and spent their time attending social function thus lacked the time to exercise. On the contrary, the New Year was described as a wake-up call to adopt healthy lifestyle choices. Holidays away from home were described as both a facilitator of and a hindrance to the adoption of healthy lifestyle choices. The desire to fit into holiday clothing encouraged the adoption of healthy lifestyle choices. However, being away from home interrupted exercise routines which participants described as difficult to re-establish and thus was a hindrance to the adoption of healthy lifestyle choices.

“But I haven’t been [to the gym] for the past 5 weeks and, that’s the problem, I can go without for 5 weeks and then it kind of ceases to be routine and I have now got to gear myself up to do it again. I’ve no problem once I start but it’s just getting in to that that routine. For example I haven’t been since, probably about, 8 or 9 weeks. We went on holiday from mid-November to early December and then we had a Christmas rush. Went to the gym regularly twice a week up until mid-November, and then we went away on holiday to Thailand for a couple of weeks and I’ve not got back in to the swing of it yet.” **UK male 4**

“I go to the gym five times a week when I can, and I mean that’s tailed off now because we’re in to the Christmas period and I’ve got busy and have got other things to do” **UK female 5**

The increased awareness of the importance of the adoption of healthy lifestyle choices in current society, and the increased availability of resources were identified by UK participants as facilitators of the adoption of healthy lifestyle

choices. However, despite the improvement, UK females mentioned that some of the recipes provided by cookery books and on cookery shows still promoted unhealthy dietary behaviours potentially hindering the adoption of healthy lifestyle choices.

“going back to the 80s and you’d go in to a shop and say does your bread have animal fat in and they’d look at as he’d got four heads and they were green, you know, but now because of people who aren’t necessarily veggies but people who want to cut down on animal fats, you know, there’s more knowledge around now, for people to absorb” **UK male 2**

“I don’t like watching cookery programmes on television because they don’t cook healthy. So I don’t watch it... I’ve got lots of cookery books, but you think ‘Oh, I’ll have a go at that’, then you look at it, you know half a carton of cream, hundred grams of butter, and straightaway I think no. You know, or I’ll try to adapt it in some way.”
UK female 1

UK males and females differed in the types of resources they mentioned. UK males recounted using mobile phone apps and attending weight management institutions to help them monitor their lifestyle behaviours. UK females recounted using calorie-carbohydrate books and traffic-light colour coded nutrition labels to guide their dietary behaviours. This corresponds with the finding that UK males were driven by a continuously search for improvement. Consequently, it follows that they would discuss the availability of resources to monitor their progress in terms of lifestyle behaviours and medical indicators.

***UK male couple 2:** “It [app on mobile phone] plays a tune when you’ve done the 10,000 steps.”*

Interviewer: “Oh! I have to ask what motivated you to start doing that.”

***UK male couple 2:** “Well it’s the phone. When I got it (laughs) and it was on and I tried it. Instead of having a pedometer, you know, you can use, just do it on here! And that one tells you the, the hours in the day, how far you’re walking.”*

“And I do use the er...calorie-carbohydrate book, the diabetic one, which is quite erm...edifying sometimes, to see how many calories there are in things, even though I’m looking at it strictly for the carbohydrates it’s er quite frightening because you don’t realise just how many calories there are in things!” **UK female 4**

Furthermore, UK males discussed an increased availability of gyms and sports facilities for golf and swimming, while UK females mentioned a lack of availability of exercise classes. This mirrors the contrast in the exercise behaviours of male and female UK participants i.e. UK males engaged in more individual gym-based activities, while UK females engaged more in group-based exercise classes.

“I pay 46 pound a month and I get all my golf free at four different golf courses, whichever one I want to play at, I can swim for nothing, I can use several gyms, several swimming pools around Sheffield for nothing, all in wit this 46 pound a month. So I thought while it’s there I’ll use it” **UK male 3**

“I did start going to a Zumba class, I quite enjoyed that, but it closed Erm [pause] it’s finding the [pause] I don’t want to go out and do the exercise at night, but it’s finding classes during the day that’s more difficult...there weren’t enough people to make it pay, so it just closed.” **UK female 3**

Sub-theme 2: “we have a compromise with the milk”

This sub-theme captures discussions about the social roles of study participants and how these roles influenced their adoption of healthy dietary and exercise choices.

Spousal role: All participants described how their roles as spouses/partners influenced their adoption of healthy lifestyle choices. Nigerian males were the only participants who did not recount instances where their spouse had in some way hindered their adoption of healthy lifestyle choices. Rather they described the role of their spouse positively and narrated instance of receiving social support that encouraged the adoption of healthy lifestyle choices. The opposite was the case in Nigerian females. They did not recount instance of receiving social support from their spouses. In fact, they rarely mentioned the roles of their spouses beyond discussing their marital obligations to maintain a body size that was favourable to their significant other and their obligation to birth and raise children, which they cited as a hindrance to the adoption of healthy lifestyle choices.

“Last week, my wife travelled ...and I had to cook for myself, I went and bought [stammer] to cook, do you know that I had sleepless night after eating that food and I knew it was that food, it was like [pants twice]. I started calling her I say well honey am [hiss] and for the first time in 10years I ever complained even myself I was afraid... I say ok call my friends from work whatever [stammers] if you call my phone and I doesn’t ring and nobody picks [laughs]. Am not feeling fine and she said nothing will happen” **NG male 2**

“Anyway it all depends on your guy sha⁶, because there are some people that will like all these slim people and they won’t want you to get fatter, so that means you have to obey the rules and regulation and just maintain your shape and don’t eat too much and most especially sleep” **NG female 3**

“To me, you know that exercise, when you are still single, to me when you are still single you can do that exercise like now am not married, I can try to do it so that I will keep weight, I will keep fit because if I married this exercise you know definitely when you marry you will have to born and you cannot do this exercise, so and definitely when you are married if your shape, your shape will still be

more bigger than you are so if you cannot control it now definitely it will affect because definitely if you gave birth, it will definitely as in your shape will come out, everything will, you will big you have to control it now.” **NG female 4**

UK participants (males and females) described how their role as spouses/partners in some cases hindered and in other cases encouraged their adoption of healthy lifestyle choices. Both genders recounted compromising with/or yielding to the unhealthy lifestyle preferences of the significant other with whom they lived. UK females recounted yielding to the encouragement from their spouses/partners to drink more alcohol, increase their portion sizes, and indulge in dietary treats. They also explained that the sedentary behaviours and influence of their spouse/partner required them to exert extra effort to adopt healthy exercise behaviours and thus was a hindrance. Likewise, albeit less common, UK males described yielding to the unhealthy dietary preferences of their wives. They also recounted yielding to their wives' concerns about the negative effects of exercise and cited this as a hindrance to the adoption of healthy exercise behaviours.

“I think it's about when you live with someone else as well, I think it's about what their attitudes are to food. Because Eve used to come home from work and say ‘Oh I'm starving, cook lots of food, I want lots of food!’... I think she encouraged me to eat badly. And to drink too much.” **UK female 5**

“when come off [the cardio machine] my heart's pumping like mad and I'm gasping for breath, and Hannah will say, that's my other half, she'll say why do you do that why do you do that? And I say well I want to make it, you know, it's a muscle, make it work, but you'll kill yourself you'll kill yourself [mimicks a female voice], [returns to normal voice] no, something's going to do at some point...I enjoy the exercise now more than I would ever have dreamed, I mean, we go, generally go Monday Wednesday Friday, sometimes I go more than that, and I think the only thing that stops me going every day is probably divorce [laughs], she'd probably get rid of me” **UK male 2**

On the other-hand, both UK males and UK females discussed receiving support from their spouses/partners that encouraged their adoption of healthy lifestyle choice. They explained that the dietary preferences and restrictions of their spouses/partners encouraged their adoption of healthy dietary behaviours. They also discussed being encouraged to engage in exercise. UK males mainly recounted feeling encouraged and not hindered by their wives. They explained that dietary preferences of their wives had encouraged their adoption of healthy dietary behaviours. One male participant even described his wife as a “*conscience*” that encouraged him to exercise. This illustrates how the wives' of UK male participants encouraged the adoption of healthy lifestyle choices. UK females also described

how their husbands' healthy dietary preferences and restrictions allowed them to "grizzle at each other" and encourage each other to adopt healthy dietary choices.

UK female couple 1: *I don't eat many carbs at all... Em... Only he couldn't understand that...When he started the cooking. 'How can you have dinner without potatoes? How can you have chilli without rice?'*

UK male couple 1: *I'm getting better but I miss, we had a [pause] I did a bit of roast pork yesterday... I try and get ones that aren't too fatty you know? And [pause] I mean she's like a surgeon! She can, she can chop fat off anything and the tiniest bit of fat and she's pushing it to the side of the plate (Laughter)*

Interviewer: *So does she then make your diet healthy?*

UK male couple 1: *Yes[pause] It's, it's [pause] I, I genuinely think if I was on my own, it would probably be, I'd probably be an awful lot worse than I am. I'll own up to that! Em I'd probably eat a lot of, more rubbish than I do*

Carer role: Female participants recruited from both countries discussed their role as care-givers in much detail. Nigerian females explained that their child-care obligations imposed time-constraints that hindered their adoption of healthy lifestyle choices. UK females on the other-hand explained that caring for their grandchildren and wanting to "spoil" them hindered their adoption of healthy lifestyle choice. They explained that the time spent caring for their grandchildren competed with time spent exercising and the former was described as taking precedence over the latter. They also explained that their desire to "spoil" their grandchildren and cater to the dietary preferences of visiting family tempted them to eat unhealthy foods they would normally avoid, thus hindering the adoption of healthy lifestyle choices.

"Sometimes fitting it [exercise] in, because I look after grandchildren, one is only three and I do Monday Tuesday with him, so he keeps me busy, the other one I fetch from school so I have to watch my times for him, so I'm quite busy at these type of things, and I'm always on the end of the phone 'mother will you do this'" **UK female 2**

"And I've two grandsons that I see a lot. And so I tend to spoil them, so if they come for lunch or for tea we probably have sausage and chips, or you know fish fingers and chips. Because I don't feed them that often, so it's nice to give them what they want." **UK female 3**

Male participants recruited from both countries did not describe themselves as carers of children or grandchildren. In fact, Nigerian males did not describe themselves as carers for anyone. Thus, they gave no account of a carer role hindering their adoption of healthy lifestyle choices. A few UK males however described how caring for their injured or chronically ill wives was time consuming and hindered the adoption of healthy lifestyle choices. Furthermore, although UK males did not specifically discuss caring for their grandchildren, they did mention

that time spent with grandchildren competed with time that could have been spent exercising and thus hindered the adoption of healthy exercise behaviours.

*“my wife’s er, had a fall she’s got a busted shoulder at the moment, that’s why she’s sat in house, and she’s got walking difficulties as well. So, I can’t get to the gym like I used to do because house needs doing, these things need doing. So I can’t do two jobs at once so one of them got to go, so at the moment am not going to the gym, which I dislike because I used to love going to the gym” **UK male 3***

Being a carer not only required participants to give support, but in some cases, it positioned them to receive support. A few Nigerian and UK females, narrated how their children encouraged them to adopt healthy lifestyle choices by providing verbal encouragement; informational support and tangible support. Some of the UK females even mentioned that they exercised with their children and cited this as a facilitator of their adoption of healthy lifestyle choices.

*“my children, yeah my children they are always going on so I have to keep fit on their account” **NG female 6***

*“My daughters are quite keen on healthy lifestyle, and they say ‘you know, you shouldn’t eat this, you shouldn’t eat that’, and they do try to help me...they nag me. So if we do go out shopping, it’s always check the green, orange and red, check everything, it doesn’t matter, even if Brenda bought a packet of crumpets she would compare one to another and see which has got the lowest fat in. So that’s what I’m doing now, so that’s what they both do with me, they’re sort of educating me in to the right food” **UK female 1***

Male participants recruited from both countries rarely discussed receiving social support from their children. Rather as discussed above under spousal support, their wives were their main source of support. However, 2 male participants did discuss receiving tangible support from their families. Despite discussing having to hide his health issues out of respect for his family name, one of the Nigerian men warmly discussed and praised his family for the tangible/financial support they had provided. He credited them with his life and current job. Likewise, one UK man also mentioned that his daughter sent him rapeseed and olive oil. He explained that this contributed to his fat reduction strategies.

*“though my parents were not wealthy, I doubt whether I would have been alive, I was spending billions...If not my brother who’s a senator, do you think it would have been easy where I am? To work where I work, in this country it’s not easy” **NG male 2***

*“the only oils I ever have I have cold pressed rapeseed oil and cold pressed olive oil from my daughter in Cyprus who gets me that, cause she’s got 60 olive trees, so that’s nice” **UK male 2***

Role as agents of change: With the exception of the Nigerian males recruited into this study, several participants (Nigerian females, UK males, UK females) described themselves as agents of change in their social worlds. They recounted how their adoption of healthy lifestyle choices encouraged healthy lifestyle changes in their children. They also mentioned how the healthy and unhealthy lifestyle behaviours of their own parents had shaped and encouraged their own adoption of healthy lifestyle choices. This illustrates how the lifestyle behaviours of parents may encourage the adoption of healthy lifestyle choices in their children. UK participants also mentioned that their adoption of healthy lifestyle choices had encouraged their spouses to adopt healthy diet and exercise behaviours. UK males also stated that their behaviours had encouraged the adoption of healthy lifestyle choices among their friends.

“when I marry, I will have like table as in timetable for food, know what I can eat what is good for my family and my children. So that I can even make my children, I will start teaching them when I have children I will start teaching them, giving them training.” **NG female 4**

UK male 4: *“Father certainly did and my mother came from that, she had a she came from a farming background and we always had erm lots, you know lots of vegetables.”*

Interviewer: “Okay so your healthy approach to eating, have you passed that onto your kids?”

UK male 4: *“Yeah, oh absolutely, oh absolutely, in fact it is quite unusual because you don’t realise until you see and they’re all married and it’s when you see their spouses what they don’t eat, for example on Christmas you know well, my wife and two of my daughters are vegetarian. They are vegetarian in the sense that they don’t eat meat but they will eat fish and erm well I suppose that’s all it probably is, but erm, at Christmas everybody loves, the sprouts, the parsnips, the carrots, those things, yeah. So actually I would say we are actually pretty high consumers of fresh vegetables.”*

“my mother had a history of health, health reasons, you know, and had a very very poorly heart and all this, and she used to think that if you were really skinny you were unhealthy so we got butter instead of margarine and sugar and things like that, so I don’t, she thought she was doing good for us and she wasn’t really but, bless her...I’ve always been overweight, but, that’s why I’ve always tried, I used to starve my children before I’d let them get fat [laughs]. That sound horrid doesn’t it, but I used to be that frightened of them getting fat that I used to not allow them to have things, you know, and mum why is it you are the only one that doesn’t bring sweets to school when you pick me up, and things like that, and I just got so worried, I had this thing about it, so that’s what, I suppose it’s just one of them things that’s embedded in your mind” **UK female 2**

Group membership: Most participants with the exception of UK males demonstrated a preference for group membership and generally described their friendships as

something they enjoyed and found beneficial. Nigerian and UK females explained that they preferred to exercise alongside their friends as this motivated them to persevere with their exercise. UK females described their friendship groups as a source of inspiration; companionship and praise. They explained that the weight changes they observed in their friends inspired their adoption of healthy lifestyle choices. They also stated that the praise they received and the companionship of sharing one's journey of making healthy lifestyle choices with other people encouraged the adoption and maintenance of healthy lifestyle choices. One UK female also cited group membership as a facilitator of statin-use. She explained that she saw taking a statin as a relatively common feature of belonging to the over 55-year age group and thus was unconcerned about taking them. This illustrates how the influence of others may normalise and indeed encourage statin-use.

“Ehhh. Friends can help you doing that. If there are around with you. Like exercise if you want to do exercise do it very very well, you have to get someone that will be gingering³you. Eh, but you can't do it alone maybe if you tire. Like me I can't do exercise alone, but if I see someone that will be doing it doing it I will be saying agh agh, how is my own different, I will try my best to follow that person [laughs]” **NG female 2**

“I had put on a quite a lot and when I finished school I thought ‘right, I'm going to do something about this’. And my friend also had finished...so we went [to weightwatchers] together and I think that helps, if you've got someone suffering in the same way [laughs]... I think that I quite enjoyed the social side of it [weightwatchers]... Because you see the same people getting weighed, so you know, they're smiling because they've lost weight, or you're consoling them because they've put weight on. And yes, so there is a social side that's quite...it works well for all the people.” **UK female 3**

Interviewer: “So do you talk about statins and high cholesterol with your friends?”

***UK female 3:** “We have done over the past, yeah. Because I think just about everyone I know is popping a statin [laughing]. And I think when I was at school a lot of us talked about it then, because you know, you come in ‘You know the doctor said I need to take this...’, and it seemed people hit a certain age. So you sort of get to 55 and they seem to need statins.”*

The predominant narrative among females was that group membership encouraged the adoption of healthy lifestyle choices. However, some UK females described group membership as a barrier to the adoption of healthy lifestyle choices. They recounted how the disapproval of friends and partners at their weight loss hindered their adoption of healthy lifestyle choices. They also mentioned that the unhealthy

³ A pidgin English word for encourage/motivate

dietary behaviours of friends at work and in other social settings made it more difficult for them to adopt healthy lifestyle choices. The males recruited from Nigeria described their membership to friendship groups as a source of companionship which they appreciated. However, they discussed tailoring their behaviours to meet the expectations of their friends and thus maintain their group membership. One of these men recounted how in his younger years he had enjoyed athletics but refrained from belonging to a group of athletes because he wanted to portray the social image of a man on a quest for money and women. He believed that membership to a group of athletes would hinder would hinder this social image. This demonstrates how the desire to maintain group membership may hinder the adoption of healthy lifestyle choices.

*"I know a few people who've said to me 'Oh, you're losing too much weight', because they'll always be people, but they tend to be people who sort of could do with losing weight...And I think that people feel threatened when you can, when somebody can do that. And I think Eve, my ex-partner, feels very threatened about it, because I'm going to the gym and stuff like that. And thinks that there's an agenda there, you know, about finding a new partner and you know" **UK female 5***

*"I just felt I couldn't mix with the people there, they were just more like people who were [pause] you know when you're in school, ok when I was in school I was very conscious of my social clique, people, girls I talked to, as in the girls I had, clique I was a club person, I was a club boy" **NG male 1***

Unlike Nigerian participants and UK females, UK males expressed a willingness to deviate from group memberships and social norms. They explained that they were comfortable going against the norm and being different. They emphasized the importance of disagreeing with others to maintain ones beliefs. They narrated instances where they actively deviated from group membership because of their personal beliefs. They cited this as a facilitator of the adoption of healthy lifestyle choices.

*"I would think out of 2000 bus drivers I was probably one of half a dozen that wouldn't eat meat, if that, you know, it was all bacon and fried eggs and things for everybody, and unhealthy food... they all went with what everybody else did, they followed the peer group, you know, whereas I've always, not sort of been different, but I've always found that my thoughts are different, you know" **UK male 2***

Public image: Male and female participants recruited from Nigeria discussed tailoring their behaviour in accordance with what they perceived the others in their social world expected of them and the way they wanted to be perceived by others. One of the Nigerian men explained that he did not want the people in his life to

know about his health problems because he did not want to be perceived differently and did not want to taint his family name. He mentioned that even his wife was unaware of his health problems until she married him. Nigerian males described their desire to maintain a public image and discussed attempting to maintain this image by either disregarding their medical world or by hiding their medical world from their social world. The former appeared to hinder the adoption of healthy lifestyle choices. The latter appeared to allow for the adoption of healthy lifestyle choices whilst still maintaining the desired public image. Nigerian females expressed concern that weight loss would elicit social concern and be interpreted by the others in their social world as an indication of illness particularly HIV or stress. Consequently, they emphasized that they did not want to lose a lot of weight and merely wanted a mild reduction in their body size. This will be further discussed under the body image analysis. This highlights the role of the perceptions of others on body image. It also illustrates how the perceived disapproval of others may hinder the adoption of healthy lifestyle choices.

*“I got my package⁴, which is heavy, which is lovely, which is not found [stammers] in this country easily, I had to celebrate with my friends and I, so even when I came to Calabar, [stammers] they challenged me, I avoided them, they were calling me, I had to switch off [refers to mobile phone]..they are still somewhere calling me up till this morning, but even when I finish here, I won't tell them that I came to clinic” **NG male 2***

*“I don't expose myself, you remember the question you ask me whether it was embarrassing to take drugs? It's actually embarrassing...It's embarrassing. So none of them know am hypertensive or I have this cholesterol...I avoid telling them, it's embarrassing, stigmatization, they will look at you, ahh you mean *****[interviewee says his surname], you are...until I married my wife she did never knew I was hypertensive or had high cholesterol..” **NG male 2***

*“Kaaaiiiii!!⁵, people will talk, they will start wondering maybe [says name] she is sick o maybe HIV” **NG female 1***

UK participants did not discuss the desire to maintain a public image and fulfil social expectations to the same extent as Nigerian participants. UK females mentioned that they believed they were better perceived by the other members of their social world when they were a smaller body size. They cited this as one of the benefits of adopting healthy lifestyle choices. This is consistent with the finding that an improved body image was the main personal factor that facilitated the adoption of

⁴ Financial bonus from work

⁵ An exclamation of dread or foreboding.

healthy lifestyle choices in the sample of UK females recruited into this study. This illustrates how the perceptions of others could encourage or reinforce the preference for a slim body type and facilitate the adoption of healthy lifestyle choices. However, one UK female disagreed with this stating that at her age, she no longer allowed the perceptions of others to influence her behaviour. Only a few UK males discussed the public image. As previously discussed under the section group membership, UK males discussed comfortably deviating from social norms. This illustrates that they had little desire to create a public image that was pleasing to the other members of their social worlds. It should be noted that although one UK man expressed a desire to improve his physical appearance, he voiced his belief that at his age, excess fat in certain areas of the body was the norm. This contrasts with the beliefs of UK females that they were better perceived by others when they had less body fat.

“its made me a bit more confident. I feel more confident when I meet people now, because I have lost about two stone overall so far. So yes, I sort of think it does make me feel that bit more confident having a better and healthier life. Because I sort of think well, I’d like to think that people look at me differently as to when I was two sizes bigger [laughing].” **UK female 1**

“I’d like to be lighter, I’d like to be down towards the middle 80s in kilos, but I also accept that I’m 67 and that might not be as easy as I would expect it to be...I’ve got this tyre round my tummy that I’d like to get rid of but then again at 67 I’m, old men have got tyres round their tummies, I think there’s only Mick Jagger that probably hasn’t, but, you know, what do you do then about that, I do what I can.” **UK male 2**

Work roles: Male participants recruited from Nigeria and the UK did not discuss the role of their work life or retirement on the adoption of healthy lifestyle choices. However, some female participant recruited from Nigeria and the UK cited the energy and time consuming nature of work-life as a hindrance to the adoption of healthy lifestyle choices. They explained that retirement afforded them the time to plan, prepare meals, exercise and enjoy cooking. However, the lack of activity and the extra time that accompanied retirement was said to encourage sedentary behaviour and boredom eating and thus hindered the adoption of healthy lifestyle choices. The gender difference in the discussions of work roles is consistent with the finding that females discussed being care-givers for their families more than males did and thus combining the caregiving roles and work-roles may not have been as much of a hindrance to male participants as it may have been to female participants.

*“When I was working I was shattered when I got in from work, and I’d sit down, fall asleep, get up, make tea, fall asleep again in front of the TV and go to bed. That’s not happening as much now, but that again, is retirement, because I’ve got more time and I’m not as pressured. So I think the payback from that is that I do take time to do a bit of exercise, to think about meals that I’m going to do. Whereas when I was working it was a case of ‘well we’ve got to have something for tea, so what shall we have?’ But now I can think about it at the beginning of the day and plan for it.” **UK female 3***

*“No before I was retired no you don’t have time, you had everything so you really couldn’t do that [adopt healthy dietary choices], it was eat what you could eat and I mean now I can go and shop around for what I want, then I really didn’t have the time.” **NG female 6***

*“the stage in our life that we’re at, we’re retired. When you’re working you’re on the go all the time, you’re burning up your energy... And I think now, because we’ve a lot of time on our hands, [says husband’s name] would eat for kingdom come, he would, but I say ‘no, I’m ok, I’m full’, so sometimes it could be boredom that encourages you to eat, and probably eat the wrong things.” **UK female 1***

6.4.3 Summary of themes from interviews with study participants

As shown in Figure 6.1 participants discussed their perceptions of high cholesterol within a medical world. They also discussed their individual perceptions and behaviours and how these existed within and were influenced by their social world.

The medical world of high cholesterol

Perceived understanding of high cholesterol: UK participants demonstrated a poor understanding of high cholesterol. They described the lifestyle advice available for the management of high cholesterol as confusing and irresolute. They mentioned that they had a better understanding of high blood pressure and diabetes and thus were better able to manage these conditions.

Perceived consequences of high cholesterol: Participants presented 2 narratives about their perceived consequences of their high cholesterol. On the one hand, they discussed how their concern that high cholesterol could lead to heart disease, stroke and early death encouraged their adoption of healthy lifestyle choices. While on the other-hand, they demonstrated how their perceptions that their high cholesterol was under control, diminished their perceived consequences of high cholesterol, potentially hindering their adoption of healthy lifestyle choices. The first narrative illustrates how perceived consequences encouraged control. The second narrative illustrates how perceived control diminished perceived consequences potentially hindering control. The factors that conferred perceived control differed by country. In Nigerian males it was conferred by faith in God and fatalistic beliefs. In

UK males it was conferred by understanding of high cholesterol, statin-use and perceived medical control of high cholesterol.

Perceived cause of high cholesterol: Study participants mostly cited lifestyle factors as the sole cause or the main factor that contributed to their high cholesterol. Nigerian participants typically cited a sole cause of high cholesterol, while UK participants mainly cited a combination of lifestyle factors and dietary factors as the cause of their high cholesterol. Participants who cited lifestyle factors as the sole cause or the main contributing factor of their high cholesterol, identified the adoption of healthy lifestyle choices as the core or a key component of their control strategy. These participants were generally classified as adopters of a low-fat diet and/or healthy exercise behaviours in the quantitative studies. This demonstrates that a congruous relationship between perceived cause of high cholesterol and perceived control of high cholesterol that features lifestyle factors could potentially encourage the adoption of healthy lifestyle choices.

Perceived control of high cholesterol: Female participants in both countries described statin-use more positively than male participants. They explained that they did not feel able to adopt healthy lifestyle choices for a variety of reasons and thus statin-use was an easier alternative. Male participants often voiced their preference to take matters into their own hands and adopt healthy lifestyle choices rather than rely on medication-use. Nigerian participants either voiced strong statin control perceptions alongside weak lifestyle control perceptions or weak lifestyle control perceptions alongside strong lifestyle control perceptions. The former was often fuelled by a perceived inability to adopt healthy lifestyle choices and mainly occurred in females who were classified as non-adopters of healthy lifestyle choices in the Nigeria quantitative study. The latter mainly occurred in participants classified as adopters of a low-fat diet and/or healthy exercise behaviours and was fuelled by concerns about the side-effects; dislike of long-term medication-use; and a congruous lifestyle cause-control perceptions. The finding that Nigerian participants typically demonstrated antagonistic relationships between statin-use and the adoption of healthy lifestyle choices mirrors the finding that they generally attributed their high cholesterol to a sole cause. Thus it follows that they would identify a sole control strategy. On the other-hand, UK participants voiced good statin control perceptions. They also expressed the belief that statin-use worked alongside the adoption of healthy lifestyle choices. This demonstrates a synchronous relationship between statin-use and the adoption of healthy lifestyle choices. These participants

were usually classified as adopters of a low-fat diet and/or healthy exercise behaviours in the UK quantitative study. This is consistent with the finding that UK participants typically attributed their high cholesterol to a combination of genetic and lifestyle factors. Thus it follows that they would identify a control strategy that combines statin-use and the adoption of healthy lifestyle choices.

Study participants typically discussed making more dietary changes than exercise changes. UK participants discussed making more exercise changes than Nigerian participants. This is consistent with the finding that UK females voiced a preference for making healthy exercise changes versus healthy dietary changes, while Nigerian females appeared to perceive exercise negatively. Notwithstanding, the most common form of exercise participant mentioned engaging in was walking. Participants also identified medical, personal and social factors that acted as benefits of and barriers to the adoption of healthy lifestyle choices for the prevention of cardiovascular disease.

Participants as individuals in their social world

Personal factors: The predominant narrative among male participants from both countries was that they had the agency to influence their behaviours if they so desired and adopt healthy lifestyle choices. This sense of agency seemed to fuel or be fuelled by a continuous search for improvement in a bid to improve one's overall health. The less dominant narrative among male participants included discussions about struggling to adopt healthy dietary choices because of a preference for a "see food diet". The predominant narrative among female participants in both countries was that concerns about their body image both encouraged and hindered their adoption of healthy lifestyle choices albeit in opposite directions. Nigerian females strongly emphasized that they did not to be too slim whilst UK females expressed a preference for slimness. The former appeared to hinder the adoption of healthy lifestyle choices to some extent, while the latter appeared to encourage the adoption of healthy lifestyle choices. This illustrates how body image ideals could influence the adoption of healthy lifestyle choices in females.

Social factors: All participants described the influence of the roles as spouses on the adoption of healthy lifestyle choices. Male participants in both countries predominantly recounted receiving support from the wives and cited this as a facilitator of the adoption of healthy lifestyle choices. Female participants in both countries predominantly cited the unhealthy preference of their spouses as a hindrance to the adoption of healthy lifestyle choices. They also described the time-

constraints and competing obligation of their role as carers for children and grandchildren as a hindrance to the adoption of healthy lifestyle choices. However, they also mentioned that they received support from their children. Common to all participant was the discussion that the lifestyle behaviours of their parents shaped their own dietary and exercise behaviours. They also recounted how they felt they had been agents of change in the lives of their children and had encouraged them to adopt healthy lifestyle choices.

Group membership was portrayed in 2 ways. On the one hand female participants in both countries and Nigerian males described their membership to friendship groups as a source of praise, support and companionship. However, they did also mention that the negative comments and unhealthy behaviours of some of their friends made it more difficult for them to adopt healthy lifestyle choices. UK males emphasized that the willingness to deviate from group membership was crucial to enable the adoption healthy lifestyle choices. This corresponds with the finding that the UK males were the only participants that did not voice a desire to appear a certain way to members of their social world i.e. maintain a public image. UK females briefly mentioned that they believed a slimmer body portrayed a more favourable public image and cited this as a benefit of the adoption of healthy lifestyle choices. A prominent narrative among Nigerian participants were discussions about disregarding, compromising or hiding their medical world of high cholesterol in order to maintain a favourable public image. This appeared to be a hindrance to the adoption of healthy lifestyle choices for the prevention of cardiovascular disease.

6.4.4 Analysis of the body image discourse of Nigerian female participants

A secondary analysis was done to further explore the perceptions of body image in Nigerian females and the role of body image on the adoption of healthy lifestyle choices. A word frequency query was run using the NVIVO 10 software package to identify the most common words in discussions of body image. Figure 6.2 is a word frequency cloud showing the top 10 words used by females in their discussions of body image. The colour and layout of the words hold no significance. The size of the words indicate frequency of use i.e. the larger the word, the more frequently it was used by participants in their body image discourse. The most commonly used word was “like”, it was used in 3 ways. Firstly, it was mainly used to introduce an example e.g. “*Because like now, me am big*”. Secondly, it was used to illustrate

personal preferences: It was used to indicate a negative preference slimness in oneself and in men, it was also used to indicate a positive preference for eating and an enjoyment of food. Thirdly, the word “like” used to indicate a willingness to “trim down/reduce weight”.

“I like a guy that is good looking, has a good height, he is not short, average height, then he is not too fat but he is just normal. Not too slim, not too slim I don’t slim guys, but not too slim. I don’t like” **NG female 1**

“I like eating well o, [laughs]” **NG female 3**

“I like to reduce weight, but not that slim o” **NG female 2**

The second most commonly used word was “just”, it was mainly used in the context of indicating a small change in body size rather than a large change e.g. “just trim down”, “just to reduce”, “just to maintain shape” and “just want to feel healthy”. These words seem to indicate that the changes in body size referred to were not large changes but were small changes. This is consistent with the choice of words female participants used to discuss weight loss. Nigerian females rarely used the words “lose weight”, the more commonly used words were “trim”, “maintain” and “reduce”. These words appear to indicate a slight change in size. The word “slim” was also a common feature of the body size discourse, appearing more frequently than its antonym “fatter” as shown by the size difference between both words in Figure 6.2. Apart from when it was used as a description of past self, the word “slim” was mainly used in a negative context. Nigerian females generally voiced not wanting to be slim or to be too slim.

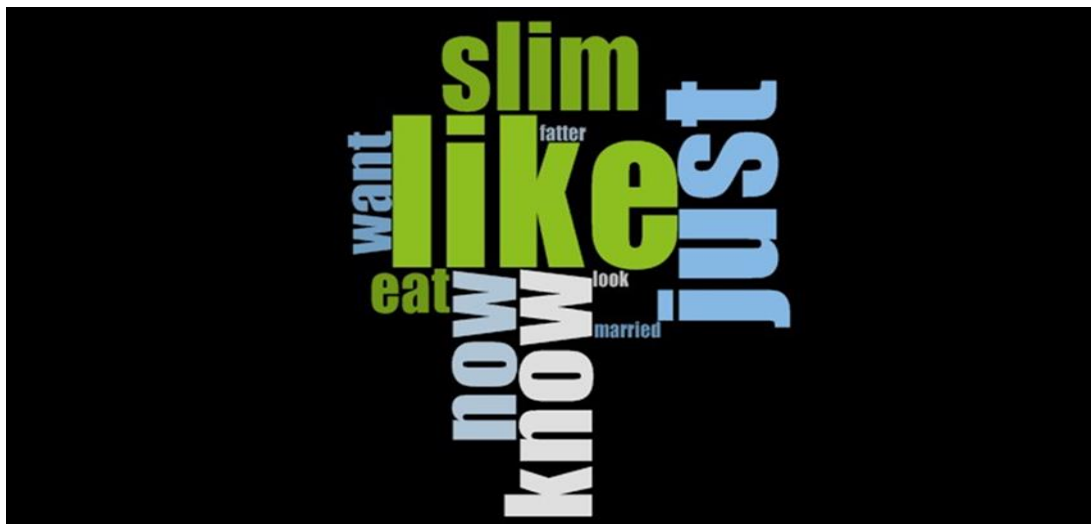


Figure 6.2: Body image discourse word frequency cloud.

Top ten words used by female participants in body image discussions, size of each word indicates frequency of use in body image discourse.

A comparison of the words used by Nigerian females in “*slim*” discourse and in “*fat*” discourse revealed some interesting difference as shown in Figure 6.3 below. There are 3 words that took centre stage in the “*fat*” discourse of Nigerian females, namely: “*like*”, “*just*” and “*now*”. The first 2 words have been previously discussed. The word “*now*” was often used to describe their current body size, marital status, dietary and exercise behaviours. It was often used to describe the lifestyle changes they were making as temporary changes made in the “*now*” for various reasons, mainly marriage. Two Nigerian females discussed their desire to “*trim down*” because they were unmarried at the time of the interview. They both stated that once married they would regain the weight as illustrated in the extract below.

“I have not gotten married, and I have not started getting children so I need to go down maybe once am pregnant or I started having one issue [child], two issue [children], I will be fatter than this, that is why I just want to trim down cos I know am on the fatty side that is why I just have to maintain myself for now because am not married. Had it been am married, as I am, I won’t have any problem, but am not married that is why I just have to go down for now” **NG female 3**

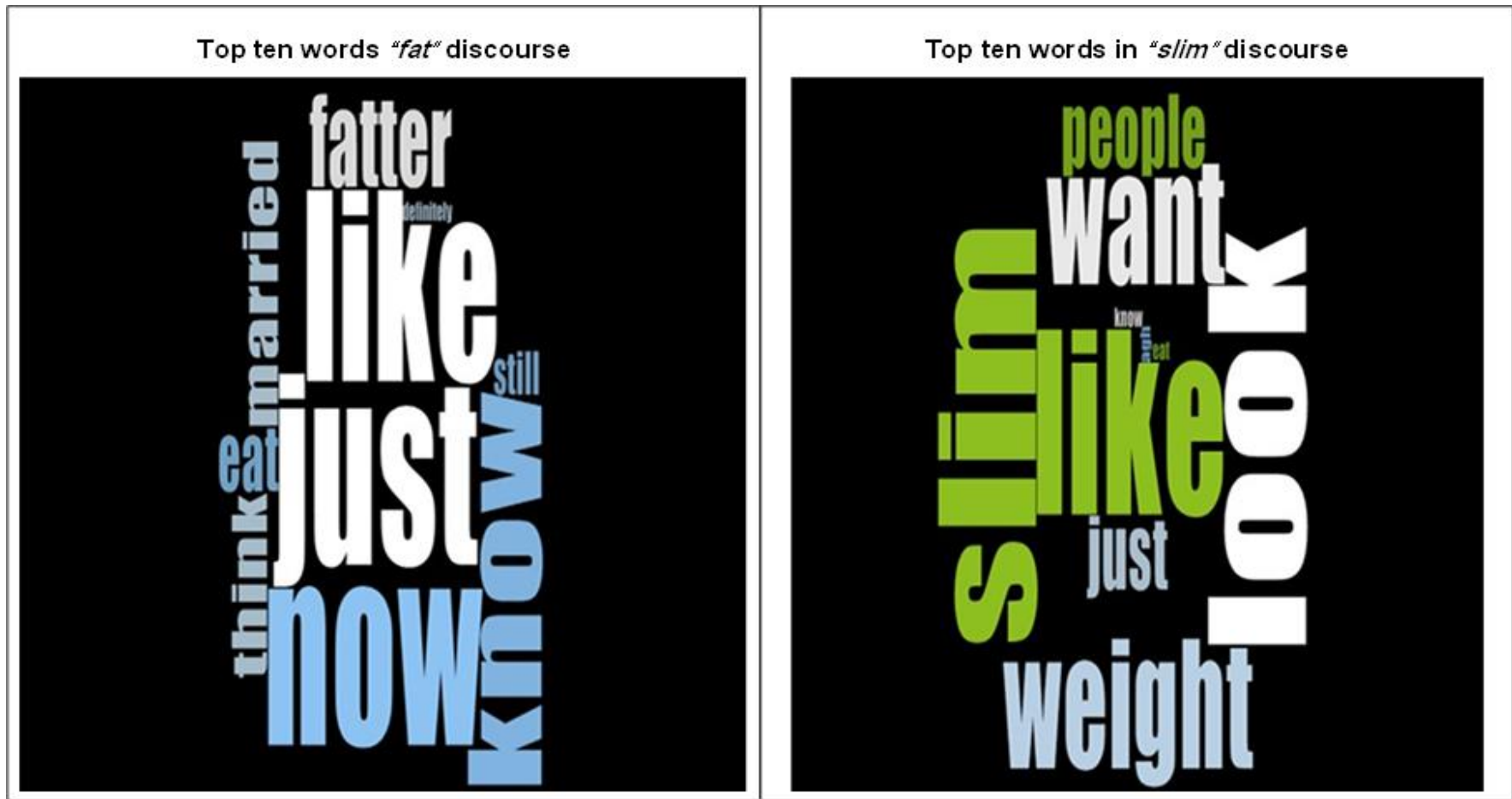


Figure 6.3: "Fat" and "Slim" word frequency cloud.

Top ten words in "fat" discourse and top ten words in "slim" discourse, the size of each word indicates frequency of use.

There are 3 words that emerged as unique to the “fat” discourse: “think”, “still” and “definitely”. “Think” was often used to narrate how not thinking reduced stress and led to weight gain. For example, in the extract below, one female described how she avoids thinking because she believed thinking/worrying could lead to weight loss, while remaining relaxed could lead to weight gain.

“I still find myself getting fatter just because I relax myself, I don’t think too much, once you think, me I don’t know how to think o, but once something hurts you for example your guy might hurt you, you start thinking or sickness, one sickness or the other, that is when you will just be thinking, by the time you know it, you wouldn’t like yourself”. **NG female 3**

The second word unique to the “fat” discourse, “still”, was used to discuss current and future weight gain as well as the current single status of female participants e.g. “But I still find myself getting fatter”, “your shape will still be more bigger than you are and “when you are still single”. The third word, “definitely” was used to discuss the perceived consequences of marriage i.e. increase in body size and childbirth which was portrayed as a hindrance to exercise. The “fat” discourse appears to suggest that female participants preferred to make temporary, slight changes in their body size because of their marital and childbearing obligations and negative perception of slimness.

The 3 words that took centre stage in the “slim” discourse of Nigerian females were: “slim”, “look” and “like”. As previously mentioned, “slim” was generally discussed in a negative light. The word “look” was used to describe the benefits of adopting healthy lifestyle choices on physical appearance e.g. “it will make me to look fit in physical aspect”, “I will look good” and “I mean I look better”.

The 3 words that emerged as unique to the “slim” discourse of Nigerian females were: “weight”, “people” and “agh”. “Weight” was used to describe how female participants did not want to lose weight e.g. “I don’t want to lose weight” and “am not erm trying to lose weight”. This further emphasizes the idea of minor changes i.e. a trim. The words “people” and “agh” were used in narrations of the perceived negative reactions of others to weight loss and was discussed under the theme “the whole world”. The “slim” discourse seems to suggest that while Nigerian females did appreciate the physical benefits of adopting healthy lifestyle choices, they did not want to be slim or too slim and felt weight loss would elicit concern and social disapproval.

⁶ Referring to not liking ones’ body image after weight loss.

In summary, most Nigerian females strongly emphasized not wanting to be slim or too slim. They expressed a willingness to make slight, temporary changes in their body size rather than major, long-term changes. From the analysis of the body image discourse of Nigerian females, body weight appears to symbolise good health, good life or a stress-free life, married life, childbirth and increasing age. In addition to this, concerns about social disapproval elicited by weight loss may hinder the adoption of healthy lifestyle choices. The body image perceptions of Nigerian females seem to hinder the long-term adoption of healthy lifestyle choices.

Chapter 7 : Discussion of research findings

7.1 Chapter overview

This chapter will begin with a synthesis of the key findings from the Nigeria quantitative study, UK quantitative study and qualitative study conducted with participants recruited from both countries. This will be followed by a discussion of how these findings compare, contrast and fit with relevant literature. The limitations of all 3 studies will be presented. This will be followed by a discussion of the clinical and public health implications of the findings of this research.

7.2 Synthesis of the key quantitative and qualitative research findings

In the section below, the 7 key findings that emerged from the quantitative Nigeria study, quantitative UK study and qualitative study will be discussed along with evidence from existing literature. The 7 key findings are: statin-use and the adoption of healthy lifestyle choices; illness perceptions and health behaviours; age and the adoption of healthy lifestyle choices; the role of gender on health behaviours and illness perceptions; diet versus exercise; the role of social environment illness perceptions and health behaviours; and social roles and the influence of “*others*” on the adoption of healthy lifestyle choices.

7.2.1 Statin-use and the adoption of healthy lifestyle choices

The primary objective of this research was to examine the influence of statin-use on the adoption of a low-fat diet and healthy exercise behaviours. This objective could not be investigated in the UK study as an inadequate number of statin-users were recruited. Consequently, no discussion of this objective will be presented for the UK.

Nigerian statin-user and non-statin users did not significantly differ in their adoption of a low-fat. However, significantly more of the former were found to be physically inactive/moderately inactive than the latter. This suggests that although statin-use appeared to be unrelated to dietary behaviours, it may have encouraged physical inactivity in the Nigeria quantitative study sample. Majority of Nigerian participants had adopted a low-fat diet. Therefore, Nigerian statin users may have felt that statin-use and the adoption of healthy dietary choices were suitable strategies to control their high cholesterol. This may have allowed them to neglect healthy exercise behaviours and become more inactive. This may have resulted from the attribution of high cholesterol to dietary factors not exercise factors. This will be further discussed under the sub-title

illness perceptions and health behaviours. Alternatively, this may have resulted from a preference for making healthy dietary changes over healthy exercise changes. This will be further discussed under the sub-title diet versus exercise.

Dietary behaviours of Nigerian participants

The dietary findings of the Nigeria quantitative study are in agreement with the findings of a study on older American adults and a study examining the influence of statin initiation on dietary behaviours. These studies found no significant differences in the fat and total caloric consumption of statin users and non-statin users (Lofgren et al., 2010, Mann et al., 2007b). This Nigeria quantitative study and the 2 aforementioned studies were relatively small in size thus may not have identified modest significant effects. One of the American studies found that statin users consumed significantly less fruits, vegetables, vitamin B12, vitamin K, calcium and potassium than non-statin users. They concluded that statin-use negatively influenced healthy dietary behaviours (Lofgren et al., 2010, Mann et al., 2007b). Similarly, a study that used American National Health and Nutrition Examination Survey (NHANES) data from 1999-2010, concluded that statin users had significantly poorer dietary behaviours than non-statin users because the fat and caloric intake of the former but not the latter significantly increased over the study period (Sugiyama et al., 2014). However, this study was a repeated cross-sectional study not a cohort study. Therefore, it may not have consisted of the same participants over time. The reverse was found by 2 larger studies conducted in Sweden and in America using NHANES data from 1999-2002 (Lytsy et al., 2012, Mann and Natarajan, 2007). These studies found that statin-users reported significantly healthier dietary behaviours than non-statin users. However the statin group in both of these studies had significantly higher cardiovascular risk profiles than the non-statin group i.e. they reported significantly more diabetes, hypertension and had experienced significantly more cardiovascular events than the non-statin group. Consequently, they may have been more exposed to lifestyle advice and may have had stronger perceptions of the consequences of high cholesterol because they had experienced more cardiovascular events. This could potentially result in the better health behaviours identified (Lytsy et al., 2012, Mann and Natarajan, 2007).

Physical activity and exercise behaviours of Nigerian participants

The findings of the Nigeria quantitative study in terms of significantly decreased physically activity among statin users than among non-statin users, differs from the exercise findings of the Swedish study (Lytsy et al., 2012). The Swedish study found significantly healthier exercise behaviours among statin users than among non-statin

users (Lytsy et al., 2012). However, as previously mentioned, the statin group in this study had a significantly higher cardiovascular disease risk profile than non-statin users. Therefore, they may have been exposed to more lifestyle advice. Furthermore, they were recruited from a pharmacy, thus may represent an adherent population. This potentially explains why they had significantly healthier exercise behaviours and dietary behaviours (Lytsy et al., 2012). The physical activity findings of the Nigeria quantitative study and the Swedish study contrast with the findings of the study on older American adults and the study that used NHANES data from 1999-2002. Both of these studies found no significant differences in the physical activity of statin users and non-statin users (Lofgren et al., 2010, Mann and Natarajan, 2007). However, the study on older American adults was relatively small thus may have been unable to identify modest significant effects (Lofgren et al., 2010). Statin users in the 1999-2002 NHANES study had a significantly higher cardiovascular disease risk profile than non-statin users which could encourage the adoption of healthy lifestyle behaviours. However, they were also significantly older and more likely to have experienced a cardiovascular disease event. This may have caused physical limitations that hindered the adoption of healthy exercise behaviours. This may explain why no differences were observed in the physical activity level of statin users and non-statin users (Mann and Natarajan, 2007). Nigerian statin-user and non-statin users did not significantly differ in their adoption of a low-fat but significantly more of the former were found to be physically inactive/moderately inactive than the latter. These findings are consistent with the findings of some studies yet contrast with the findings of other studies. This highlights the need for more research to clarify the nature of the relationship between statin-use and the adoption of healthy lifestyle choices for the prevention of cardiovascular disease.

Statin-use alongside the adoption of healthy lifestyle choices

Interviewees recruited from both countries discussed 2 types of relationships between statin-use and the adoption of healthy lifestyle choices. They discussed a synchronous relationship between statin-use (medical control) and the adoption of healthy lifestyle choices (lifestyle control). Interviewees in both countries also discussed an antagonistic medical-lifestyle control relationship. A synchronous medical-lifestyle control relationship is the perception that statin-use and the adoption of healthy lifestyle choices work in unison to control high cholesterol. Most interviewees who demonstrated this relationship were classified as adopters of a low-fat and/or healthy exercise behaviours. A synchronous medical-lifestyle control relationship was

exemplified in the UK quantitative study by the closeness of the mean perceived statin control perceptions and the mean personal control perceptions. This relationship was exemplified in the Nigeria quantitative study by the finding that the odds of reportedly adopting a low-fat diet significantly increased as perceived statin control of high cholesterol increased.

Discussions of a synchronous relationship between statin-use and the adoption of healthy lifestyle choices was a common narrative among UK interviewees but was rarely discussed among Nigerian interviewees. This may have occurred because Nigerian interviewees typically attributed their high cholesterol to a sole causal factor while UK interviewees generally attributed their high cholesterol to a combination of factors. Consequently, it follows that because UK interviewees attributed their high cholesterol to a combination of medical and lifestyle factors, they identified a combination of medical and lifestyle factors as a suitable control strategy. Likewise, because Nigerian interviewees attributed their high cholesterol to a sole cause, they identified either medical or lifestyle factors as a suitable control strategy. This demonstrates congruous cause-control perceptions. This will be further discussed under the section on illness perceptions and health behaviours.

Another reason for the difference in discussions about the use of statin alongside the adoption of healthy lifestyle choices in both countries is that medication-use alongside self-management control strategies has become relatively common place in Western countries that have experienced chronic illnesses over a longer period of time. Whereas in non-Western countries such as Nigeria that are just undergoing the epidemiological transition from communicable to non-communicable diseases, chronic illness is still relatively new (Dahiru.T and Ejembi.CL, 2013, Makusidi et al., 2013, Unwin et al., 2001).

The reasons for perceiving a synchronous relationship between statin-use and the adoption of healthy lifestyle choices remains unknown (Lytsy et al., 2012). However, research cites 3 possible explanations. The first is that the initiation of statin-use may increase risk perception and serve as a wake-up call that facilitates the adoption of healthy lifestyle choices (Lytsy et al., 2012, Mann and Natarajan, 2007). The prescription of a statin may increase awareness of the consequences of high cholesterol encouraging the adoption of healthy lifestyle choices. This will be further discussed under the sub-title illness perceptions and healthy behaviours. The second possible explanation is that the general dislike for medication-use or concerns about long-term medication-use may encourage the adoption of both medical and lifestyle

control strategies in an attempt to lower cholesterol and cease medication-use (Mann and Natarajan, 2007). The third explanation is that lifestyle changes were initiated at the same time as statin-use (Mann and Natarajan, 2007). This may have resulted from statin initiation serving as a wake-up call or simply because both control strategies were prescribed at the same time.

Preference for statin-use versus adopting healthy lifestyle choices

Interviewees recruited from both countries demonstrated antagonistic relationships between statin-use and the adoption of healthy lifestyle choices in 2 different directions. However, this was a more common narrative among Nigerian interviewees than among UK interviewees. Some interviewees voiced strong statin control perceptions alongside weak lifestyle control perceptions. This illustrates an antagonistic medical-lifestyle control relationship that favours statin-use. Yet others voiced weak statin control perceptions alongside strong lifestyle control perceptions. This illustrates an antagonistic medical-lifestyle control relationship that favours the adoption of healthy lifestyle choices.

An antagonistic medical-lifestyle control relationship that favours statin-use was only discussed by female interviewees and was predominantly discussed by Nigerian interviewees. This highlights the finding that statin-use was perceived more positively by females than by males. Interviewees who demonstrated this relationship were classified as non-adopters of both a low-fat diet and healthy exercise behaviours. These perceptions seemed to be fuelled by a perceived inability to adopt healthy lifestyle choices due to a weak sense of agency, pleasure derived from eating or competing priorities. Statin-use in this scenario was portrayed as an easier alternative to the adoption of healthy lifestyle choices. This is consistent with the quantitative findings from both the Nigeria and UK studies that the adoption of healthy lifestyle choices was perceived as more beneficial than statin-use for the prevention of cardiovascular disease but was reportedly thought to have more barriers i.e. was perceived to be more difficult. This may also explain why UK non-adopters of a low-fat diet reported stronger statin-control perception than personal control perceptions. These findings demonstrate how strong statin control perceptions and a perceived medical-lifestyle control relationship that favours the former, could hinder the adoption of healthy lifestyle choices by providing an alternative and thus enabling people to continue to make poor lifestyle choices.

Statin-use has indeed been found to be perceived as easier than the adoption of healthy lifestyle choices. In some instances it has been perceived as a replacement

strategy rather than a complementary control strategy (Lofgren et al., 2010, Mann et al., 2007b). Statin-use has also been found to create a sense of freedom from dietary restrictions that potentially allows participants to make poor dietary choices (Mann et al., 2007a, Tolmie et al., 2003). Mann found that over the 6-month duration of a study on statin initiation, perceived statin control significantly increased while perceived lifestyle control significantly decreased. This demonstrates an antagonistic medical-lifestyle control relationship that favours the former in accordance with the findings of this research (Mann et al., 2007b). Mann also found that some participants reportedly begun statin-use because of their perceived inability to adopt healthy lifestyle choices (Mann et al., 2007b). The perceived inability to adopt healthy lifestyle choices is not the only factor that may encourage statin-centric control perceptions. Sugiyama *et al* postulated that people who are unwilling to adopt healthy lifestyle choices may be more likely to initiate statin-use (Sugiyama et al., 2014). Perceived inability or unwillingness to adopt healthy lifestyle choices only explains one side of the statin-centric story i.e. weak lifestyle control perceptions. The other side, i.e. strong statin control perceptions may be explained by the immediate effects of some lipid-lowering medications. According to Lofgren *et al*, rapid improvements in lipid profile following initiation of lipid-lowering medications may foster perceptions of medical control of high cholesterol. Consequently, because individuals believe their high cholesterol is under control they see no need to employ additional control strategies such as the adoption of healthy lifestyle choices (Lofgren et al., 2010). This may explain why perceived medical control of high cholesterol increased over time in Mann's 2007 study: as participants' lipid profiles improved, their perceived statin control perceptions improved, potentially hindering the adoption of healthy lifestyle choices (Mann et al., 2007b)

The findings of research and other relevant literature suggests that strong statin control perceptions (resulting from perceived medical control of high cholesterol), alongside weak lifestyle control perceptions (resulting from perceived inability or unwillingness to adopt healthy lifestyle choices) may encourage an antagonistic medical-lifestyle control relationship that favours statin-use. This fosters the perception that statin-use is an alternative to the adoption of healthy lifestyle choices. Thus potentially hindering the adoption of healthy lifestyle choices. This poses a problem as the effect of statins are enhanced by the adoption of healthy lifestyle choices (Athyros and Mikhailidis, 2014, Chiuve et al., 2006, Cobb et al., 1991, Hunninghake et al., 1993). Furthermore, a healthy lifestyle is beneficial for the control of other cardiovascular disease risk factors, non-communicable diseases and promotion of overall health (World Health Organisation, 2010).

Preference for adopting healthy lifestyle choices versus statin-use

The second antagonistic medical-lifestyle control relationship identified in this research was an antagonistic medical-lifestyle control relationship that favoured the latter. This relationship was demonstrated by interviewees who voiced weak statin control perceptions alongside strong lifestyle control perceptions. The weak statin control perceptions discussed by these interviewees appeared to be fuelled by: a general dislike for medication-use; concerns about the effect of long-term medication-use; concerns about side-effects; and the perception that high cholesterol was caused by lifestyle factors thus should be controlled by lifestyle factors i.e. congruous cause-control perceptions. The strong lifestyle control perceptions voiced by these interviewees resulted from their desire to take matters into their own hands rather than rely on medication-use. The latter was more commonly discussed by UK males and is consistent with their perceived strong sense of agency. Most interviewees who voiced these perceptions were classified as adopters of a low-fat diet and/or healthy exercise behaviours. This demonstrates how weak statin control perceptions and an antagonistic medical-lifestyle control relationship that favours the latter could encourage the adoption of healthy lifestyle choices but hinder statin-use.

Only a handful of studies have examined patient perceptions of statin-use. The findings of these studies, in accordance with the findings of this research indicate that a preference for making lifestyle changes may hinder adherence to statin-use (Chee et al., 2014, Harrison et al., 2013, Mann et al., 2007a). This preference may have occurred because of a general dislike of medication-use not just statin-use. This often results from the negative depictions of medication-use by friends, family and the media (Chee et al., 2014, Harrison et al., 2013, Tolmie et al., 2003). Much like some of the interviewees in this research, new statin users in a focus group expressed their concerns about the long-term effects of statin-use, specifically citing liver damage, coenzyme Q10 depletion and kidney damage as their key areas of concerns. They reportedly rarely discussed these concerns with health care professionals. Rather, they discussed this with family and friends. They also obtained information from the internet which is a questionable source of credible information that often focuses more on the risk of statin-use than on its benefits (Tolmie et al., 2003). Furthermore, some individuals simply perceive medications as overused substances that could potentially cause harm and thus preferred to adopt healthy lifestyle choices or use other non-pharmaceutical methods such as herbal remedies and supplements (Casula et al., 2012, Vicki et al., 2010). Indeed a study investigating the reason for primary non-adherence to statin-use in American adults found that a third of non-adherent

participants reported using herbs and supplements to control their high cholesterol (Harrison et al., 2013).

Some interviewees described concerns about side-effects as a reason for their preference for making healthy lifestyle choices. Existing literature has found that side effects of statins such as nausea and myalgia encouraged non-adherence (Chee et al., 2014, Harrison et al., 2013, Mann et al., 2007a, Vicki et al., 2010). However, the authors of the aforementioned focus group argued that concerns about side-effects were merely a justification given by participants for poor adherence rather than an actual driver of non-adherence (Tolmie et al., 2003). Unlike the other studies that investigated patient perceptions of statin-use, this focus group included participants who had experienced a cardiovascular event (Tolmie et al., 2003). Consequently, as postulated by the health belief model, these participants would have weighed the perceived benefits of statin-use (secondary cardiovascular disease prevention) against its perceived barriers (adverse effects) and may have chosen the former over the latter. Furthermore, unlike the other studies that recruited new statin users, this focus group was predominantly comprised of adherent statin-users, who had been taking a statin from anywhere between 8-months to 8-years (Tolmie et al., 2003). Thus concerns about adverse events may have somewhat diminished in long-term users who may have become accustomed to statin-use.

The third reason given for a preference for making healthy lifestyle choices over statin-use was that the latter was an unsuitable control strategy. This may be because high cholesterol was perceived to be caused by lifestyle factor and thus lifestyle was perceived as a suitable control strategy. A focus group found that despite having good statin control beliefs, some participants did not believe statin-use was necessary for them. This was especially the case in people whose cholesterol levels were close to target lipid levels and thus did not feel that statin-use was significantly beneficial (Vicki et al., 2010). Doubts about the benefits of statin-use may be exacerbated by the asymptomatic nature of high cholesterol i.e. if people feel healthy, it is difficult to encourage them to take a statin especially when their lipid levels are close to recommended levels (Vicki et al., 2010). Tolmie *et al's* qualitative exploratory study found that participants whose preferred control strategy (in this case lifestyle control) conflicted with the suggested control strategy (in this case medical and lifestyle control), either partially adhered, substituting part of the suggested control with their preferred strategy (in this case placing greater emphasis on lifestyle changes than on statin-use) or completely rejected the suggested strategy and adopted their preferred strategy (Tolmie et al., 2003).

The findings of this research and other relevant literature suggests that a preference for the adoption of healthy lifestyle choices may potentially hinder statin-use. This may result from a general dislike for medication-use; concerns and the long term effects and side effects of statin-use; lifestyle congruous cause-control perceptions; and underestimation of the ability of statin-use to control high cholesterol. This poses a problem especially among individuals with significantly elevated cholesterol levels who would benefit from the synergistic effects of statin-use alongside the adoption of healthy lifestyle (Chee et al., 2014, Cobb et al., 1991, Hunninghake et al., 1993).

7.2.2 Illness perceptions and health behaviours

The second objective of this research was to examine the influence of statin-use on the way people think about high cholesterol and their future cardiovascular disease risk. Nigerian statin users reportedly perceived cardiovascular disease as significantly more severe than Nigerian non-statin users. This may explain why more Nigerian statin users reportedly adopted a low-fat diet than Nigerian non-statin users. However, this was not the case with healthy exercise behaviours. This may be because high cholesterol was associated with dietary factors not physical inactivity. This will be further discussed under the sub-title diet versus exercise preferences. Statin-use appeared to influence illness perceptions in UK interviewees by conferring a sense of control of high cholesterol that diminished the perceived consequences of high cholesterol. This appeared to hinder the adoption of healthy lifestyle choices. This will be further discussed under the heading perceived consequences of high cholesterol.

Perceptions about statin-use and perceptions about the relationship between statin-use and the adoption of healthy lifestyle choices were not the only factors that seemed to influence health behaviours, 2 other illness perceptions, namely: perceived consequences of high cholesterol and congruous cause-control perceptions also appeared to influence the adoption of healthy lifestyle choices.

Perceived consequences of high cholesterol

The third objective of this research was to examine the influence of illness perceptions on the adoption of a low-fat diet and healthy exercise behaviours. Two illness perceptions were found to influence the adoption of healthy lifestyle choices and/or statin-use in Nigerian and UK participants, namely: perceived consequences of high cholesterol and cause-control perceptions.

Nigerian and UK interviewees described how their perceived consequences of high cholesterol encouraged their adoption of healthy lifestyle choices and/or statin-use.

Unique to male interviewees recruited from both countries was the discussion that perceived control of high cholesterol hindered their adoption of healthy lifestyle choices. This may explain why the mean perceived consequences scores reported by participants in both the Nigeria and the UK quantitative studies were low i.e. the second lowest score. In both quantitative studies, the highest scores reported were for personal and statin control of high cholesterol as well as perceived benefits of statin-use and the adoption of healthy lifestyle choices for cardiovascular disease prevention. This suggests that participants perceived their high cholesterol as controllable and perceived lifestyle changes and statin-use as appropriate cardiovascular disease prevention strategies. This may have encouraged the perception that their high cholesterol was under control and diminished perceived consequences of high cholesterol, potentially hindering the adoption of healthy lifestyle choices.

The findings of the 2 studies identified in chapter 2 that used the CSM to examine the influence of illness perceptions of high cholesterol on adherence were in accordance with the consequence findings of this research. Brewer found that participants who believed their high cholesterol increased their risk of experiencing a cardiovascular event were more adherent to their medication (Brewer et al., 2002). Coutu found that people who thought high cholesterol could clog their arteries and lead to cardiovascular event and who attributed their high cholesterol to poor dietary and exercise behaviours, were more adherent to healthy dietary changes (Coutu et al., 2003).

However, majority of the studies identified in chapter 2 that used the CSM to examine the influence of illness perception of hypertension on adherence found the opposite to be the case. They found that perceived consequences of hypertension was inversely correlated with adherence to medication, self-management and stress-reducing behaviours (Chen et al., 2009, Hekler et al., 2008, Hsiao et al., 2012, Ross et al., 2004). One explanation for this inverse relationship was that strong perceptions of the consequences of hypertension may elicit an emotional response that could lead to denial and avoidance and other maladaptive coping behaviours that hinder adherence to treatment advice (Ross et al., 2004). Despite finding significant correlations between perceived consequences and adherence, only 1 of these studies found perceived consequences to be significantly associated with adherence behaviours in a regression model. Hekler's study on African Americans found that perceived consequences predicted stress-reducing behaviours but not medication adherence (Hekler et al., 2008). Research evidence gives 2 explanations for the inability of perceived consequences to predict adherence behaviours in hypertension studies, both of which emerged in the findings of this research. One explanation is that people concentrate on

the illness construct in the forefront of their current lives. Consequently, perceptions of consequences only become an issue for consideration when the health threat begins to affect ones' everyday life. Thus for asymptomatic conditions such as high cholesterol and hypertension, perceived consequences may play a minimal role (Meyers et al., 1985). The second explanation is that perceived control coupled with perceive chronicity may diminish perceived consequences and emotional response to a health threat (Horne et al., 2010). Both of these explanations suggest that perceived control and lack of tangible complications of a health threat may diminish the perceived consequences of the health threat. This is consistent with the findings of this research.

In this research, that factors that conferred perceived control of high cholesterol potentially diminishing perceived consequences of high cholesterol differed between Nigerian males and UK males. Nigerian males cited faith in God and fatalistic beliefs as the factors that conferred perceived control of their high cholesterol. UK males cited their understanding of high cholesterol, statin-use and not experiencing any negative effects of statin-use or high cholesterol i.e. medical factors as the factors that conferred a sense of control of high cholesterol. Religion plays a major role in the way Nigerians perceive the world around them and make sense of illness, death and suffering (Falola, 2001). Indeed research evidence suggests that religion can play an important role in coping with chronic illness (Weaver and Ellison, 2004). Religion has been shown to have positive effects on management of chronic illness such as reducing anxiety and depression that may sometimes occur due to chronic illness and thus encourage adherence behaviours. In some instances religious activity such as praying and attending church are used alongside other treatment strategies as demonstrated by Nigerian female interviewees. However, it could swing the other way as it did with Nigerian male interviewees and foster a sense of control that hinders the adoption of other control strategies, in this cases statin-use and/or the adoption of healthy lifestyle choices (Koenig, 2002).

Cause-control cluster

The second illness perception that seemed to influence the adoption of healthy lifestyle choices was the perceived cause of high cholesterol. Nigerian interviewees attributed their high cholesterol to a sole factor i.e. either genetics or lifestyle. UK interviewees predominantly identified a combination of genetic factors and lifestyle factors to various degrees as the cause of their high cholesterol. This is consistent with the finding that there was a marked difference in the statin control and personal control perceptions reported by Nigerian participants whilst these scores were very similar in UK

participants. A difference was also found in the reported lifestyle and biomedical causal perceptions of Nigerian participants whilst these scores were very similar in UK participants. The attribution of high cholesterol to mainly 1 factor by Nigerian interviewees demonstrates the relative newness of the chronic illness model that consists of a lifestyle and a medical component which is relatively common place in the UK.

Most interviewees demonstrated a congruous or somewhat congruous relationship between the perceived cause of their high cholesterol and the perceived control of their high cholesterol i.e. the causal perceptions and the control perceptions of most interviewees appeared to match-up. Congruous cause-control perceptions that favoured medical factors appeared to hinder the adoption of healthy lifestyle choices and occurred in an interviewee classified as a non-adopter of both a low-fat diet and healthy exercise behaviours. Congruous or somewhat congruous cause-control perceptions that favoured the lifestyle factors appeared to encourage the adoption of healthy lifestyle choices and occurred in interviewees who were often classified as adopters of a low-fat diet and/or healthy exercise behaviours. This is consistent with the reporting of lifestyle factors as the most common cause of high cholesterol alongside the reporting of stronger personal control perceptions than statin control perceptions, highlighting a lifestyle congruous cause-control relationship in Nigerian participants. However, congruous cause-control perceptions were not always the case. Participants who cited genetics as the cause of their high cholesterol discussed the importance of both the adoption of healthy lifestyle choices and statin-use. This illustrates an incongruous/ somewhat incongruous cause-control relationship. These participants narrated a family history of high cholesterol and other cardiovascular disease risk factors. Therefore they may have received more health information and consequently been more aware of the importance of statin-use alongside the adoption of healthy lifestyle choices for the management of high cholesterol.

The findings of the studies identified in chapter 2 that used the CSM to examine the influence of illness perceptions of high cholesterol and hypertension on adherence to self-management behaviours were consistent with the findings of this research. Coutu's study on high cholesterol found that identifying lifestyle factors as the cause of high cholesterol alongside perceptions of the consequences of high cholesterol was significantly associated with the adoption of healthy dietary behaviours over the 1 year study period (Coutu et al., 2003). This demonstrates how cause and control perceptions cluster potentially influencing health behaviours. The findings of the hypertension studies that investigated both medication adherence and self-

management behaviours found that attribution of hypertension to stress was inversely associated with medication adherence (Chen et al., 2009, Hekler et al., 2008, Pickett et al., 2013). Attribution of hypertension to medical and lifestyle factors was positively associated with the adoption of healthy lifestyle choices (Hekler et al., 2008). This is consistent with the idea that control perceptions need to match-up with causal perception to encourage adherence. Thus consistent with the findings of this research, participants in these CSM studies demonstrated that congruous cause-control perceptions could potentially influence health behaviours and thus the adoption of healthy lifestyle choices and/or statin-use for the prevention of cardiovascular disease.

Existing evidence in accordance with the findings of this research also suggests that congruous cause-control perceptions do not always occur. The findings of the studies identified in chapter 2 that used the CSM to examine the influence of illness perceptions of high cholesterol and hypertension on medication adherence found no relationship between perceived cause and perceived control (Brewer et al., 2002, Meyers et al., 1985, Ross et al., 2004). One explanation given for this in the literature is that causal attributions may be an important illness construct for adherence to treatment regimen that require change in lifestyle behaviours but not for treatment regimen that require only medication adherence (Meyers et al., 1985). This may be because people really need to believe that a particular lifestyle behaviour causes a particular health threat before they embark on the journey to change their behaviour, whereas the same is not the case for medication adherence, which is perceived as easier to change (Lofgren et al., 2010, Mann et al., 2007b).

Some of the hypertension studies that assessed the influence of illness perceptions on adherence found that socio-cultural factors significantly influenced adherence to self-management behaviours (Chen et al., 2009, Pickett et al., 2013). These studies found that the attribution of hypertension to uncontrollable factors such as chance in Pickett's study or the attribution to casual factors relating to traditional Chinese medicine or Taiwanese folk medicine, were inversely associated with adherence to self-management behaviours (Chen et al., 2009, Pickett et al., 2013). This is consistent with the finding that Nigerian interviewees who discussed the role of fatalism or faith in God on their high cholesterol appeared to externalize control of their high cholesterol. This appeared to hinder their adoption of healthy lifestyle choices and statin-use. As previously discussed under the perceived consequences section above, religion is a key component of the social world of Nigerians. Thus the findings of this research and existing research evidence highlight the importance of examining illness perceptions

within the social context in which self-management behaviours such as adoption of a low-fat diet and healthy exercise behaviours occur.

In summary, perceived consequences of high cholesterol appeared to encourage the adoption of healthy lifestyle choices. Perceived cause and perceived control of high cholesterol often appeared to match-up to form congruous cause-control perceptions which seemed to influence statin-use and/or the adoption of healthy lifestyle choices. Thus as cause and control perceptions appear to cluster, it may be important to emphasize the causal role of lifestyle factors and where appropriate medical factors. This may encourage control perceptions that include both lifestyle factors and statin-use and thus facilitate the adoption of healthy lifestyle choices alongside statin-use.

The final objective of this research was to examine the influence of social factors on statin-use; the adoption of a low-fat diet and healthy exercise behaviours; perceptions of high cholesterol; and perceived future risk of cardiovascular diseases. This research found that social factors such as social environment; social roles and the influence of “others” influenced illness perceptions and healthy behaviours. In addition to social factors, personal factors such as age, gender and preference for diet versus exercise also influenced illness perceptions, statin-use and the adoption of healthy lifestyle choices. In the section below the personal factors that influenced these illness perceptions and healthy behaviours will be discussed. This will be followed by a discussion of the social factors that influenced illness perceptions, statin-use and the adoption of healthy lifestyle choices.

7.2.3 Age and the adoption of healthy lifestyle choices

Age emerged as a personal factor that influenced the adoption of healthy lifestyle choices in participants recruited from the UK. It was not found to influence the adoption of healthy lifestyle choices in participants recruited from Nigeria. The findings of the UK quantitative study indicate that diet adopters and exercise adopters were reportedly younger than diet non-adopters and exercise non-adopters. However, only the former was statistically significant. UK interviewees in the qualitative study expanded on this by explaining that they found it harder to adopt healthy lifestyle choices with age because the body aches/pains and physical limitations of ageing such as osteoporosis and osteoarthritis prevented them from exercising as often or as vigorously as they would prefer. They also explained that poor weather conditions, particularly ice hindered their adoption of healthy exercise behaviours because they were concerned about falling and sustaining physical injury. This may explain why majority of the participants were classified as being inactive/moderately inactive. Another explanation

for the low levels of physical activity observed in this study may be that as previously mentioned in the methods section, the GPPAQ which was used to assess the physical activity level of participants does not include walking. This was the most common form of exercise discussed by interviewees. Consequently, it can be assumed that the physically activity level of the study sample may have been underestimated.

Research evidence contrasts with dietary findings of the UK quantitative study. Research suggests that older adults eat healthier diets and are more likely to adopt other health behaviours such as going to the doctors than younger people. This is because they perceive themselves as more susceptible to illness and thus are more concerned about their health behaviours (Sarafino and Smith, 2014). However, in agreement with the findings of this UK study, existing literature suggests that physical activity particularly vigorous activity is inversely associated with age (Bauman et al., 2012, Hallal et al., 2012a, Sherwood and Jeffery, 2000). Consistent with the findings of this research, cross-sectional surveys have found that most common form of exercise is walking (Sherwood and Jeffery, 2000). The reason for this may be that although there are many benefits of exercise, it can cause musculoskeletal injuries that most people particularly older adults would much rather avoid as identified in this research (Sherwood and Jeffery, 2000). In addition, walking is an inexpensive form of exercise. It has also been suggested the older adults exaggerate the perceived dangers of exercise, feel too embarrassed to exercise, and underestimate their physical abilities (Sarafino and Smith, 2014). The participants recruited from the UK were older adults who were concerned about their physical limitations. Some research suggests that in such a population, high levels of physical activity may be perceived as daunting and thus hinder the adoption of healthy exercise behaviours. Thus emphasis should be placed on reducing sedentary behaviours by spending more time doing light intensity exercise such as walking which is inexpensive, convenient and confers positive health benefits regardless of its intensity (Owen et al., 2009, Sherwood and Jeffery, 2000). Greater awareness or emphasis on low intensity exercise and highlighting age-appropriate exercise strategies may reduce concerns about sustaining physical injury and the physical limitations of ageing and thus encourage older adults to take part in physical activity.

7.2.4 The role of gender on health behaviours and illness perceptions

Gender was found to influence the dietary and exercise behaviours of study participants as well as their perceived benefits of and barriers to the adoption of healthy lifestyle choices.

Perceived ease of adopting healthy lifestyle choices

The predominant narrative among male interviewees from both countries was that they had the agency to influence their behaviours if they so desired and adopt healthy lifestyle choices. This sense of agency seemed to be fuel or be fuelled by a continuous search for improvement in a bid to improve one's overall health. Female interviewees recruited from both countries perceived the adoption of healthy lifestyle choices to be more difficult than their male counterparts. So much so, that they discussed statin-use more positively than males. Some of them even demonstrated a preference for statin-use over the adoption of healthy lifestyle choices because they perceived it as an easier alternative. However, this contrasts with the UK quantitative finding that male participants reported stronger statin control perceptions than female participants. Furthermore, the quantitative findings of both countries demonstrated that male participants reportedly consumed more fried foods on a weekly basis than their female counterparts. Male participants may have indeed adopted healthier dietary and exercise behaviours than females. Alternatively, they may just have thought they did because they had more faith in their ability to change their behaviours than their female counterparts. Consequently, male participants may have over-reported healthy lifestyle behaviours because they were reporting lifestyle behaviours consistent with their perceived sense of agency, perpetuating the image that they were capable of adopting healthy lifestyle choices if they so desired.

One possible explanation for the gender differences in the perceived ease of the adopting of healthy lifestyle choices is from the perspective of masculinity. According to existing literature, most men in the Western world are socialised to be masculine. Hegemonic masculinity is described as the highest form of masculinity in the gender order. Many men aspire to this form of masculinity because it is associated with power, success, health and assertiveness (Barry and Yuill, 2011). This desire to portray hegemonic masculinity and thus be perceived as manly, may explain why male interviewees emphasized their ability to control their behaviours and influence the behaviours of others around them. Some of the features of hegemonic masculinity include health, competitiveness, assertiveness and rationality. These features may have fuelled their sense of agency. Thus they perceived themselves and/or wanted to portray themselves as able to control their behaviours when necessary to achieve a desired result (Barry and Yuill, 2011). Furthermore, for UK males the quest for overall health may have occurred because of the need for a new aim or challenge among retirees who may in the absence of their work-life appreciate a new quest. Research suggests that Nigeria socialises men to be domineering (Awosan, 2009). The features

of this dominance such as the ability to conquer, protect, control and make decisions (Uchendu, 2007) mirror features of hegemonic masculinity.

Facilitators of the adoption of healthy lifestyle choices

The greatest differences between genders and between both countries were the personal factors that appeared to influence the adoption of healthy lifestyle choices. Male interviewees recruited from both countries predominantly described their sense of agency as the main factor that influenced their adoption of healthy lifestyle choices. As discussed above this may have been a feature of hegemonic masculinity expressed by male interviewees. Female interviewees recruited from both countries described body image concerns as the main personal factor that influenced their adoption of healthy lifestyle choices albeit in opposite directions. Nigerian females explained that they were willing to make small, temporary, changes to their body size. They emphasized that they did not want to be too slim as they perceived slimness negatively and felt significant weight loss would elicit social concern. Thus Nigerian females demonstrated a preference for plumpness. This appeared to hinder the adoption of healthy lifestyle choices to some extent. It also implies that body fat is an indication of marital status and motherhood, portraying a motherly figure as more voluptuous than the figure of a single female. UK interviewees on the other hand demonstrated a preference for slimness and mention that they believe they were better perceived by others when they were slimmer. This appeared to encourage the adoption of healthy lifestyle choices.

Research evidence suggests that the difference in the body image discussions of the female interviewees recruited from both countries reflect the different body image ideals of both countries. There is a sizeable body of research that supports the finding that Nigerian females demonstrate a preference for plumper body sizes. Indeed females in many developing countries demonstrate a preference for larger body sizes and perceive plumpness as a sign of beauty, power, wealth, fertility, health and respect (Helman, 2007, Ofosu et al., 1998, Toriola et al., 1996). The Nigerian perception of beauty is plumpness with a prominent backside (Oloruntoba-Oju, 2007). The slim beauty also has a place in Nigerian society but this form of beauty appears to be less prominent (Oloruntoba-Oju, 2007). Indeed a traditional practice in Cross-River state, the semi-urban site for this research, is the sending of females to fattening houses (Ofosu et al., 1998). The length of stay in a fattening house indicates the wealth of the female's father, i.e. the longer a female stayed, the richer her father (Helman, 2007, Ofosu et al., 1998). It should be noted that fat and flabby is not perceived as desirable, rather attractiveness and femininity are equated with being shapely (Ofosu et al.,

1998). Even the language used to describe a larger figure is more positive, words like obesity and overweight are not used, rather more positive words such as healthy are used (Ofosu et al., 1998). This concurs with the finding that the word slim was often used negatively. It should be noted that due to the weight-loss associated with HIV/AIDS, it was sometimes referred to as the slim disease (De Cock et al., 1991). This may be partially responsible for the negative connotations associated with the word slim. In a country where scarcity, poverty and illness are rife, a plumper body denotes abundance, wealth and health. Slimness on the other-hand, is associated with hunger, ill-health, weakness and HIV/AIDS (Helman, 2007, Ofosu et al., 1998). Thus body weight appears to be inversely associated with socioeconomic status (Toriola et al., 1996). The preference for larger body sizes, referred to by some as cultural obesity, may explain why Western body ideals are not necessarily welcome in developing countries and why the notion of weight loss by adopting healthy dietary and exercise behaviours may be met with some cultural resistance (Helman, 2007). Some research does however mention a change in the body image perceptions of young non-Western females in-line with the preference for slimness globally propagated via the media (Swami, 2013, Swami et al., 2012, Toriola et al., 1996).

Existing literature suggests that females in the West have been subjected to the tyranny of slimness because slimness is perceived more positively in Western society. In the Western world, a slim body denotes attractiveness, youth, success and self-control (Barry and Yuill, 2011, Bordo, 1990). A fat body reflects lack of will-power, poor self-control and laziness (Barry and Yuill, 2011, Bordo, 1990). Thus the preference for slimness often referred to in the literature as the tyranny of slimness causes Western females to use diet and exercise as tools to shape their bodies and control their weight (Ussher, 2000). Interestingly, the perception of control over one's body in existing literature seems to be associated with slimness, while a lack thereof with being fat. Attempts to maintain a slim body often requires time, determination and self-discipline (Barry and Yuill, 2011). Thus the perceived weak sense of agency expressed by female interviewees and their struggles with dietary restrictions may actually have occurred because there are assessing themselves against what many have described as unrealistic/unattainable societal body image ideals. The tyranny of slimness prevalent in the Western world targets females more than it does males (Bordo, 1990). Thus more females perceive themselves as fat and this causes them to aspire to achieve a smaller body size (Bordo, 1990, van Wersch 1998). This may provide an explanation for the gender differences in the facilitators of the adoption of healthy lifestyle choices observed in this research and in existing literature (Gochman, 1997).

The findings of this research and existing evidence suggest that the adoption of healthy lifestyle choices is influenced by body image ideals. These findings also highlight that body image ideals are social constructs that vary between societies potentially impacting on females more than on males. Consequently, it is important to consider these ideals and the influence of these ideals on health behaviours that play an important role in cardiovascular disease prevention.

The gender differences in the key facilitators of adoption of healthy lifestyle choices manifested in the different ways male and female interviewees discussed target setting and progress monitoring. In-line with the desire for an improved body image, female interviewees described their weight loss targets and successes in terms of clothing size. Male interviewees discussed their targets and successes in terms of exercise ability, weight, health indicators and clothing size i.e. a multifaceted set of indicators which is consistent with their desire for improved overall health.

Dietary and exercise behaviours

Male and female interviewees recruited from the UK differed in their actual health behaviours. More UK male participants reportedly consumed fried foods on a weekly basis than UK female participants. Although no gender differences were found in reported exercise behaviours, the qualitative study found that the types of physical activities males and females interviewees discussed engaging in differed. UK males mentioned swimming, playing golf and gardening. UK females described engaging in group-oriented physical activities such as Zumba and yoga classes. Furthermore, gym-related activities also differed by gender: males recounted using cardio-machines, weightlifting and doing strength exercises such as crunches; while females mentioned using treadmills. Thus, although the general exercise behaviour of male and female participants appeared to be similar, the specific activities they engaged in differed. Females tended to engage more in group activities and less vigorous forms of exercise.

Existing literature agrees with the UK study findings that females consumed healthier diets than males (Barry and Yuill, 2011). The latter are thought to consume more meat, less fruits, larger portion sizes and eat quicker than females (Barry and Yuill, 2011). Research evidence also concurs that sports and exercise are very gendered (Barry and Yuill, 2011). The gender difference does not only occur in types of sports and exercise but also in the amount of physical activity engaged in by both genders (Gochman, 1997). In agreement with the findings from UK interviewees, research suggests that males are more likely to engage in more vigorous exercise than females

(Barry and Yuill, 2011, Gochman, 1997, Sarafino and Smith, 2014). Three reasons are given for this: one reason is that females have historically been perceived as physically weaker and more vulnerable to injury than males (Scully, 1998). Furthermore, vigorous physical activity was perceived as a potentially harmful to the reproductive abilities of females (Scully, 1998). Consequently, females were deterred from high-intensity or vigorous physical activity. Rather they were encouraged to take part in lower-intensity forms of physical activity that required less physical contact, less speed and more use of implements (Scully, 1998). A second reason given is that the male physical form is more muscular than the female form. Therefore, it can partake in and withstand activities that require a stronger body (Barry and Yuill, 2011). The third reason given is that males were socialised to take part in more competitive and physically tasking forms of exercise to assert and validate their masculinity (Barry and Yuill, 2011, Gochman, 1997).

Role of gender on dietary versus exercise behaviours

Gender was found to influence the preference for diet versus exercise in participants recruited from both countries albeit in opposite directions. Most female interviewees in the UK study voiced a preference for making healthy exercise changes whilst UK males voiced a preference for making healthy dietary changes. The latter explained that because they had not been previously physically active but had relatively healthy diets, making dietary changes was easier as it required less modification. This may explain why significantly more UK dietary adopters were classified as physically inactive/moderately than UK dietary non-adopters. This illustrates how the adoption of healthy dietary changes may allow for poor exercise behaviour. On the contrary, UK females explained that they preferred to make healthy exercise changes for 3 reasons: firstly, because they found the routine nature of exercise easier to adhere to; and secondly because they disliked having dietary restriction. This may explain why significantly more UK exercise adopters ate fried foods at home on a weekly basis than UK exercise non-adopters. Therefore, doing more exercise may have created the perception that they were making healthy lifestyle changes and could afford to indulge in some of their fried food treats. This illustrates how adopting healthy exercise behaviours may allow for poor dietary behaviours. Thirdly, UK females mentioned that they found exercise enjoyable. This highlights the fact that in regard to exercise, interviewees cited finding enjoying exercise as a facilitator of its adoption and not enjoying exercise as a hindrance to its adoption. Although enjoying healthy eating was discussed, it was seldom discussed as facilitator of the adoption of healthy dietary behaviours. Thus while enjoyment seems to play a role in adopting healthy exercise

behaviour, it did not play a role in adopting healthy dietary behaviour. Rather, despite describing making healthy dietary changes as difficult, interviewees mentioned continuously battling to improve their dietary behaviours. This demonstrates that adopting healthy dietary behaviours seemed to be perceived as a core lifestyle strategy for the management of high cholesterol whilst the adoption of healthy exercise behaviour seems to be perceived as an additional strategy to be engaged in if one finds it enjoyable and has the required physical capacity.

The finding that UK female interviewees demonstrated a preference for adopting healthy exercise behaviours whilst males demonstrated a preference for adopting healthy dietary behaviours differs from existing literature. There is a significant body of research which suggests that men are more likely to engage in physical activity than women (Bauman et al., 2012, Gochman, 1997, Hallal et al., 2012b, Sherwood and Jeffery, 2000). The reason given by male interviewees for their preference for making dietary changes is consistent with the idea that dietary guidelines have been around longer than exercise guidelines. Thus people are relatively familiar with and have adopted healthy dietary behaviours. Adopting healthy exercise behaviours however appears to be somewhat new and in the case of male interviewees this appeared to hinder the adoption of healthy exercise behaviours. One of the reasons given by female interviewees for their preference for exercise behaviours was that they found exercise more enjoyable. This may be because females took part in more social forms of exercise. This is consistent with existing literature on the preference of older/retired females for meaningful social interactions than older/retired males (Rainey, 1998).

Nigerian female interviewees opposed the preference for exercise voiced by UK female interviewees. The former identified more barriers to making healthy exercise changes than they did to adopting healthy dietary changes. They seemed to perceive exercise as something stressful that could lead to pain and could negatively impact health. This may explain why less Nigerian female exercise non-adopters reportedly considered adopting healthy exercise behaviours in the month prior to the study than males.

The data available on physical activity in Nigeria is sparse. However, physical inactivity appears to be more common among Nigerian females than among Nigerian males (Abubakari and Bhopal, 2008). This may be because most Nigerian males tend to have more active occupations and are generally more likely to take part in recreational activities than females (Iloh et al., 2011, Ojo and Mohammed, 2013). Furthermore, authors claim that traditional African culture discourages physical exercise, encourages sedentary occupations and promotes weight gain in females because obesity is

culturally acceptable and indeed desirable, especially among females, in whom it is thought to portray affluence. (Iloh et al., 2011, Ogunmola et al., 2013, Sani et al., 2010).

The difference in the preference for diet versus exercise between Nigerian and UK females may reflect their differences in body image perceptions. As previously mentioned, females in the Western world have been subjected to the tyranny of slimness, while females in non-Western countries seem to demonstrate a preference for plumpness. Although both diet and exercise act as tools to achieve the ideal body image (Bordo, 1990, Ussher, 2000), exercise has the added precision of allowing for the toning and sculpting of desired body parts with exercise classes named after the areas they target e.g. *“fab abs”*, *“gorgeous glutes”*, *“bums, legs and tums”* and so on. Consequently, it follows that females in the West would favour exercise, whilst non-Western females who perceive curves as an indicator of beauty, health, wealth and fertility may appreciate fuller *“glutes”* thus may be less inclined to engage in such activities (Helman, 2007, Ofosu et al., 1998, Oloruntoba-Oju, 2007). The difference in the perceptions of exercise between Nigerian and UK female interviewees may also be because the former were younger. Thus Nigerian females may have still had child-caring obligations that older UK females may have replaced for more flexible grandmother duties. Therefore, the UK females may have been able to enjoy the social element of exercise which Nigerian females may have perceived as a hindrance to their family obligations.

Males and females appeared to differ in their health behaviours (preference for diet versus exercise behaviour and preferred types of physical activity). They also appeared to differ in their illness perceptions (perceptions of statin-use; perceived ease of adopting healthy lifestyle choices; and perceived facilitators of the adoption of healthy lifestyle choices). Thus gender specific lifestyle advice and health information that acknowledges the gender differences in dietary and exercise preferences and behaviours may be beneficial for facilitating the adoption of healthy lifestyle choices. Furthermore, an awareness of the different factors that facilitate the adoption of healthy lifestyle choices and the differences in target setting and progress monitoring among genders may be beneficial for tailoring lifestyle advice and health information. Finally, attempts should be made to improve the perceived ease of adopting healthy lifestyle choices among females by identifying and targeting the barriers that hinder their adoption of healthy lifestyle choices for the prevention of cardiovascular disease.

7.2.5 Diet versus exercise

A similarly high proportion of participants in both the Nigeria and the UK quantitative studies had adopted a low-fat diet. The highest proportion of adopters of a low-fat diet was found in the Nigerian urban population, followed by the UK population and lastly, the semi-urban Nigerian population. This may suggest that urban dwellers in Nigeria may be consciously trying to revert from the unhealthy dietary behaviours they adopted from the Western world. On the contrary, semi-urban dwellers may be adopting unhealthy behaviours which they may have to revert from to prevent the rise of cardiovascular disease in Nigeria.

Majority of participants in both quantitative studies were non-adopters of healthy exercise behaviours and were classified as being physical inactive/moderately inactive. However, twice as many UK participants had adopted healthy exercise behaviours than Nigerian participants. The highest proportion of adopters of healthy exercise behaviours was found the UK population followed by the Nigerian urban population, and lastly, the Nigerian semi-urban population. This may indicate that adoption of healthy exercise behaviours is gradually gathering momentum.

Participants recruited from both countries in the quantitative and qualitative studies demonstrated a preference for diet versus exercise. This may be because participants who attributed their high cholesterol to lifestyle factors attributed their high cholesterol to dietary causes not physical inactivity. Indeed UK interviewees whose causal perceptions included lifestyle factors specifically cited poor diet. Physical inactivity was scarcely mentioned and when it was mentioned it was only ever discussed in conjunction with poor diet i.e. lifestyle causal factors were diet only or diet and physical inactivity, never physical inactive alone. Most participants demonstrated congruous cause-control perception. Thus it follows that because diet was the main lifestyle factor identified, dietary changes would be the main behaviour change made to control high cholesterol. Thus, more participants would have adopted a low-fat diet than would have adopted healthy exercise behaviours. Furthermore, the perception that high cholesterol was caused by and thus controlled by dietary factors may explain why more statin-users in the Nigeria quantitative study adopted a low-fat diet and but were significantly more inactive/moderately inactive than non-statin users. Adopting a low-fat diet may have created the perception that in addition to statin-use, they were making healthy lifestyle changes to control their high cholesterol thus did not need to worry about physical activity. This illustrates how adopting healthy dietary behaviours may allow for

poor exercise behaviours. Consequently, exercise may be the unnoticed child trailing in the shadows of his dominant siblings' statin-use and dietary adoption.

Research has found that majority of adults are physically inactivity and physical inactivity has been described as a major global public health problem (Bauman et al., 2012, Hallal et al., 2012a). The prevalence of physical inactivity in Nigeria is thought to have increased as a result of rapid urbanisation, increased use of technology and improved transportation (Hallal et al., 2012a). The data available on physical inactivity in Nigeria is limited (Abubakari and Bhopal, 2008). The studies that have assessed physical activity are difficult to compare because they define and assess physical activity differently thus yield a very wide range of prevalence of physical inactivity. The findings from the Nigerian Heart Foundation survey indicates that many Nigerians are physically inactive i.e. engage in less than 30-minutes of moderate-intensity physical activity at least 5 times a week. Half of the participants in this survey did not reportedly walk or cycle for a minimum of 10 consecutive minutes each day (Nigerian Heart Foundation et al., 2003).

Existing literature agrees with the preference for making healthy dietary changes versus exercise changes. Indeed, many researchers have voiced the need to pay more attention to and encourage the adoption of healthy exercise behaviours by the general population. Despite the evidence of the benefits of physical activity on cardiovascular disease prevention, non-communicable disease prevention and overall health, society may have taken little notice. This may be because the guidelines for physical activity are relatively new in comparison to guidelines for healthy dietary behaviours. Dietary guidelines were published in the early 20th century mainly to prevent malnutrition during wartime. International guidelines for physical activity only emerged in most countries at the beginning of 21st century (Steer et al., 2014). In a country like Nigeria where malnutrition has been a major issue, more attention may be paid to dietary behaviours rather than to exercise behaviours. Furthermore, insecurity in some parts of Nigeria may limit outdoor activities such as jogging. The lack of gyms, sports clubs, playgrounds, swimming pools and other exercise-enabling infrastructure may also explain why majority of participants in the Nigeria quantitative where inactive/moderately inactive and chose to adopt healthy dietary behaviours versus healthy exercise behaviours. This may also explain why a greater proportion of Nigerian participants were classified as physically inactive/moderately inactive than UK participants.

Das and Horton also suggested that the lack of attention to exercise behaviours is because physical inactivity is regarded as a risk factor for obesity rather than a risk

factor for poor health. Therefore, physical activity is perceived as secondary risk factor rather than a primary risk factor to be targeted alongside dietary control (Das and Horton, 2012). Yet another reason for the dietary preference may be that less is known about physical inactivity and its determinants (Sherwood and Jeffery, 2000).

Furthermore, strategies to promote physical activity are difficult to implement and assess in terms of effectiveness and real life benefits. Consequently, physical activity may have become the quiet underdog whose importance is increasingly becoming a topic for discussion (Bauman et al., 2012, Weiler and Stamatakis, 2010).

The quantitative and qualitative findings of this research and the existing literature indicate that there is a preference for making healthy dietary changes than healthy exercise changes. The reason for this may be because: diet is perceived as a causal factor for high cholesterol while physical inactivity is not; exercise guidelines are relatively new and possibly less commonly known in comparison to dietary guidelines. Thus it is important to emphasize the role of physical inactivity as a causal factor to ensure that lifestyle congruous cause-control perceptions include elements of both diet and exercise. This may debunk any myths about the benefit of exercise. This may also discourage the perception that the adoption of healthy exercise behaviour is a replacement for the adoption of healthy dietary behaviours or is a supplementary control strategy and facilitate the adoption of both healthy dietary behaviours and healthy exercise behaviour.

7.2.6 The role of social environment on illness perceptions and the adoption of healthy lifestyle choices.

In the Nigeria quantitative study, the location from which participants were recruited was significantly associated with the adoption of a low-fat diet and influenced healthy exercise behaviours. The findings of the Nigeria quantitative study indicate that semi-urban dwellers were less likely to reportedly adopt healthy lifestyle behaviours than urban dwellers. However, this does not necessarily mean that urban dwellers had healthier lifestyle behaviours than semi-urban dwellers. Urban dwellers would have been more exposed to the fast-food culture and sedentary lifestyle that has become prevalent in Nigeria's urban capital of Abuja. Furthermore, they were significantly more likely to have lived outside Nigeria in the 10-years prior to the study. Therefore, they may have been more exposed to Western diets and acquired more unhealthy behaviours than semi-urban dwellers. This is corroborated by the finding that urban dwellers were significantly more likely to consume fried foods on a weekly basis than semi-urban dwellers. Consequently, the large disparity in the adoption of healthy

lifestyle choices observed between urban and semi-urban dwellers may have occurred because the former had acquired more unhealthy behaviours that they were actively trying to correct. Another explanation may be that urban dwellers had more facilities and resources available that facilitated the adoption of healthy lifestyle choices than semi-urban dwellers. This is consistent with discussions among interviewees recruited from the UK that the adoption of healthy lifestyle choices was easier because more resources are available in current society than in the past. The main environmental barrier mentioned by interviewees recruited from the UK was poor weather conditions, particularly ice.

Several studies in agreement with the findings of the Nigeria quantitative study reported a higher prevalence of cardiovascular disease risk factors in residents of urban areas than in the inhabitants of rural areas of Nigeria. They interpreted this as an indication of the adoption of Western lifestyle in urban Nigeria (Okpechi et al., 2013, Ulasi et al., 2010). The adoption of Western lifestyle in urban areas may be filtering out to semi-urban and rural areas as a result of rural-to-urban migration. Many working-age adults, particularly males leave their homes in semi-urban or rural areas to work in urban areas (Ejim et al., 2011, Ulasi et al., 2010). These men go home for holidays and take with them their Westernised ways (Onwubere et al., 2011). Consequently, it follows that prevalence of cardiovascular disease risk factors in semi-urban and rural areas is on the rise (Ejim et al., 2011). Rural-to-urban migration not only contributes to the spread of Westernized dietary and exercise behaviours but may also limit the resources available in semi-urban and rural populations. The exodus of working-age adults to urban areas leaves behind an abundance of children, elderly people and women in semi-urban and rural areas (Onwubere et al., 2011, Ulasi et al., 2010). Therefore, many semi-urban and rural areas have less income available than better resourced urban areas (Ejim et al., 2011).

The disparity in available resources may also explain the differences in the reported illness perceptions of semi-urban and urban dwellers. According to Geoffrey Rose, preventive medicine is a luxury (Rose, 2008). Therefore, those more concerned with immediate priorities may be less likely to consider preventive health a priority (Rose, 2008). This would explain why participants recruited from the site with fewer resources, in a country that battles non-communicable diseases alongside communicable diseases would perceive more barriers to and significantly less benefits of the adoption of healthy lifestyle choices for the prevention of cardiovascular disease. Furthermore, the deferred risk of cardiovascular disease may have been perceived as significantly less severe by semi-urban dwellers than by urban dwellers because the former were

more concerned with using their limited resources to cater to daily priorities and communicable diseases. The latter are often acute in nature and require immediate action, as opposed to chronic conditions that take years to develop and are often unseen. Consequently, it follows that semi-urban dwellers would be less likely to report the adoption of a low-fat and healthy exercise behaviours than urban dwellers.

7.2.7 Social roles and the influence of “others” on the adoption of healthy lifestyle choices

Interviewees described the influence of the roles of their spouses on their adoption of healthy lifestyle choices. Male interviewees recruited from both countries predominantly recounted receiving support from their wives and cited this as a facilitator of the adoption of healthy lifestyle choices. Female interviewees recruited from both countries predominantly cited the unhealthy preference of their spouses as a hindrance to their adoption of healthy lifestyle choices. This is consistent with the finding that majority of participants in both the Nigeria and UK quantitative studies reportedly consumed fried foods at home rather than away from home. Female interviewees recruited from both countries also described the time-constraints and competing obligation of their role as carers for children and grandchildren as a hindrance to the adoption of healthy lifestyle choices. This highlights how the lifestyle behaviours and care needs of family members particularly the inhabitant of ones' home influence the adoption of healthy lifestyle choices.

According to existing literature, in traditional Nigerian societies females are predominantly responsible for the running of the home and caring for the family (Falola, 2001). Thus although males head the household (Falola, 2001), women carry the bulk of the responsibility for ensuring food security of the household and ensuring that the nutritional requirements of members of the household are adequately met (Turshen, 1991). Furthermore, household chores, food preparation and childcare responsibilities are the domain of the female (Falola, 2001). Thus the findings of this research and existing literature suggest that the marital and child-bearing obligations of Nigerian females may hinder their adoption of healthy lifestyle choices.

In addition to discussions about the influence of spouses and family members, interviewees recruited from both countries also described the influence of the distal members of their social world i.e. the “others” on their adoption of healthy lifestyle choices. The predominant narrative among Nigerian interviewees was that the influence of the “others” in their social world hindered their adoption of healthy lifestyle

choices. Mutual to both the male and female Nigerian narrative was the desire to maintain a certain public image and thus appease the “*others*” in their social world. The nuances of this narrative differed by gender. Nigerian males either hid or completely disregarded health behaviours that may portray them as less manly. This desire to appear and even maybe perceive oneself as manly may have fuelled the strong sense of agency that they cited as a facilitator of their adoption of healthy lifestyle choices. However the desire to maintain a manly public image seems to contradict with discussions about being willing and able to change the health behaviours if they so desired. However it is consistent with discussions about the quest for money and women as a priority that competes with the adoption of healthy lifestyle choices. Nigerian female interviewees on the other-hand discussed a desired to be perceived as healthy and happy. They voiced a strong preference for not being too slim and seemed to aim for a middle ground between being slim and being voluptuous. This suggests an appreciation for a somewhat slim figure with womanly curves. The negative perceptions of slimness may be because in a country like Nigeria burdened by malnutrition and communicable diseases such as HIV, slimness is perceived as a sign of poor health and low socioeconomic status. Thus the desire to appear healthy would require one to have some body fat. Single female interviewees recruited from Nigeria described their desire to slim down as temporary because once married, they would regain the weight. This highlights the importance of marriage and motherhood to the female role and is consistent with discussions about marital and childbearing obligations as a hindrance to the adoption of healthy lifestyle choices

Literature on hegemonic masculinity seems to be consistent with the social pressures described by Nigerian males. One of the features of hegemonic masculinity is good health. This would explain why male interviewees felt the need to hide or disregard their health problems as voicing such indicates weakness (Barry and Yuill, 2011). Power, success, competitiveness and dominance are also features of hegemonic masculinity that may explain the quest for money and women that was described as a hindrance to the adoption of healthy lifestyle choices (Barry and Yuill, 2011, van Wersch 1998). Furthermore, this may be fuelled by the traditional perception among Nigerians that the ability of man to care for a large family i.e. many children and in some cases many wives is an indicator of his wealth, virility, success and social status (Falola, 2001).

The vast literature available on body image describes body image ideals as a social construct, determined by the culture and beliefs of the social world in which a female is socialised (Ussher, 2000). This is consistent with the discussions of how illness

perceptions such as the association of slimness with HIV created a preference for plumpness to which Nigerian females try to adhere to for fear of eliciting social concern. Discussions about family obligations as a hindrance to the adoption of healthy lifestyle choices concurs with literature that suggests that marriage confers respect and higher social status to females, so much so that many females would rather marry into polygamous homes, or tolerate infidelity in monogamous marriages than be single or divorced (Falola, 2001). Furthermore, females in Nigerian society are predominantly charged with childrearing and caring for their homes. Therefore, the desire to maintain a happy home and care for their family may hinder the adoption of healthy lifestyle choices in Nigerian females.

The predominant narrative among UK interviewees about the influence of the “*others*” in their social world on the adoption of healthy lifestyle choices differed by gender. UK males described deviating from friendship groups and cited this as a facilitator of the adoption of healthy lifestyle choices. This is consistent with the finding that UK males typically discussed engaging in individual exercise activities and mainly discussed receiving support from only their spouses. UK females on the other-hand, predominantly described their membership in friendship groups as a source of inspiration, praise and companionship that encouraged their adoption of healthy lifestyle choices. This may explain why UK female participants reportedly received significantly more tangible support and more of all other forms of social support (emotional and informational support; affectionate support; and positive social interaction) than UK male participants. UK females also mentioned engaging in group-oriented forms of physical activities. This may also explain why the odds of adopting healthy exercise behaviours increased as the reported number of close relatives and friends increased. These females mentioned receiving support from their spouses, children and friends.

Research evidence concurs with the finding that older males and females perceive friendships differently. Older males tend to have more causal friendships based on common interests and activities. Consequently, male social networks are often comprised of many acquaintances (Rainey, 1998). Thus because they tend to have more causal friendships, their main source of intimacy comes from their spousal relationships. Research suggests that older males often cite their wives as their best friends (Rainey, 1998). This is consistent with the finding that males in this UK study cited their wives as their main source of social support. Conversely and in agreement with the findings of this UK study, older females place a lot of importance on their friendships. Their social networks consist of long-term, intimate friendships based on

support (Rainey, 1998). Females are thought to seek out support from family and friends because they are by nature more emotional than males (van Wersch 1998). According to the direct hypothesis of social support, membership to friendship creates the perception that one is a valued member of a social network which increases self-esteem and the perceived control of one's environment. This encourages the adoption of healthy lifestyle choices (Cohen and Syme, 1985). This echoes the benefits of group membership described by the female interviewees in this UK study. This type of social support may have been perceived as more beneficial by females because they narrated their struggles to adopt healthy lifestyle choices unlike males who voiced a strong sense of agency. Therefore males may have benefitted less from this form of social support and thus did not seek out such support and did not feel the need to belong to friendship groups.

The adoption of healthy lifestyle choices appears to be gendered and to vary by country. This highlights the importance of considering the influence of gender as well as social roles, norms and expectations on illness perceptions and health behaviours.

7.3 Conclusion

This research found that significantly more Nigerian statin users were inactive/moderately inactive than Nigerian non-statin users. However, no significant differences in the dietary or exercise behaviours of UK participants was identified. The findings of this research suggest that the factors that influenced statin-use and the adoption of healthy lifestyle choices in both countries clustered into 3 categories, namely: medical factors, personal factors and social factors. In both countries, statin-use influenced the adoption of healthy lifestyle choices in 3 different ways: the former hindered the latter; the latter hindered the former; and the former and latter worked in unison. Similar medical factors influenced statin-use and/or the adoption of healthy lifestyle choices in participants recruited from the UK and the Nigeria. However, the nuances of these factors differed slightly between countries. Perceived consequences encouraged the adoption of healthy lifestyle choices and/or statin-use. However, perceived control of high cholesterol diminished perceived consequences and hindered the adoption of healthy lifestyle choices and/or statin-use. In participants recruited from Nigeria perceived control was conferred by faith in God and fatalistic beliefs, whilst in the UK sample statin-use and perceived medical control conferred a sense of control. Participants mainly voiced congruous cause-control perceptions that influenced statin-use and/or adoption of health lifestyle choices. Participants in the Nigeria sample were more likely to attribute their high cholesterol to 1 casual factor and discussed 1 control

strategy. They were also less convinced about the benefits of statin-use as their UK counterparts. The UK sample however, attributed their high cholesterol to a combination of factors and cited a combined control approach as suitable. This may be because the exposure to chronic illness that involves a medical and a lifestyle component and statin-use are relatively new in developing countries but have become common place in developed countries.

The greatest divergence between the samples from both countries was observed in the personal factors that influenced the adoption of healthy lifestyle choices. Male participants in both countries appeared somewhat similar, voicing their strong sense of agency. UK males took this a step further and discussed a quest for overall health that fuelled or was fuelled by this sense of agency. Females in both countries perceived the adoption of healthy lifestyle choices to be more difficult than their male counterpart. Both female samples cited body image concerns as the personal factor that influenced their adoption of healthy lifestyle choices. However, the content of their discussion markedly differed. Nigerian females discussed a preference for plumpness while UK females described their preference for slimness. This difference reflects the difference in perceptions of beauty and body image ideals in their respective social contexts.

The social worlds of Nigerian and UK participants appeared to be gendered and in some instances similar yet differed in others. Nigerian interviewees seemed to experience social pressure to maintain a public image that conforms to societal standards of beauty and prosperity. This appeared to hinder their adoption of healthy lifestyle choices. The UK interviewees seemed to conform to their own preferences and demands or those of the significant others with whom they lived.

The findings of this research suggests that faith in God and fatalistic beliefs; chronic illness mind-set ; concerns about statin-use; body image ideals; and pressure to conform to societal perceptions of prosperity differed between participants in both countries and influenced statin-use, the adoption of healthy lifestyle choices and illness perceptions. This highlights the importance considering health behaviours and illness perceptions in the context in which they exist because elements of this context may shape illness perceptions and influence health behaviours.

7.4 Research limitations

The limitations of each of the 3 studies conducted as part of this research will be discussed below. The overall limitations of the design and methods of data collection of the quantitative studies and the qualitative study will be presented. This will be followed by a discussion of the limitations specific to each study.

7.4.1 Limitations of the quantitative studies (Study 1 and Study 2)

A cross-sectional study design was employed thus study findings are specific to a particular point in time. Illness perceptions often develop and change with time (Stack et al., 2011). Therefore it is important to remember that the findings presented in these studies reflect the illness perceptions and health behaviours of study participants at the time of the study. Furthermore, although cross-sectional research can identify relationships between variables, causality cannot be inferred (Bryman, 2008, Walter, 2012). Research acknowledges that the nature of the relationship between illness perceptions and health behaviours is complex. The former may influence the latter but the latter may also feedback and influence the former (Pickett et al., 2013, Salovey and Rothman, 2003). Thus collecting data at a single point in time simplifies the complex relationship between illness perceptions and health behaviours. Therefore, no claims can be made about whether certain illness perceptions caused certain health behaviours or vice versa. It merely allows for an examination of the relationship between certain illness perceptions and health behaviours.

This research examined self-reported lifestyle behaviours. Self-report is one of the most common measures of adherence. However, it is thought to overestimate adherence to health behaviours (Dunbar-Jacob et al., 2002, Hekler et al., 2008). Self-reported measures are subject to recall bias especially in older people for whom recall may be challenging and inaccurate (Lofgren et al., 2010). Furthermore, self-reported measures are subject to the accuracy of the assessment made by an individual i.e. people may think they have made significant reductions to their dietary fat consumption when they may have only made minor changes. Nevertheless, self-report is an inexpensive way to assess health behaviours and mirrors the information given to clinicians (Hekler et al., 2008).

The questionnaire used for data collection comprised a combination of various scales. Modifications were made to certain sub-scales and the age range of study participants exceeded the age range for which some sub-scales were validated. Ideally, when a data collection tool is modified, combined with other tools or used on a different

population, the reliability and validity of the questionnaire should be re-assessed. However, due to time constraints, it was not possible to re-assess the questionnaire and ascertain whether it was still reliable and valid after modifications had been made to it for the purpose of this research.

The Nigeria and UK sample were not comparable because the source of participants; method of data collection; and cardiovascular disease risk profile of both sample were markedly different. The Nigeria sample were recruited from a hospital thus may represent an adherent population. The UK sample were recruited from a research-ready population. In both cases, generalizability of the sample is limited, albeit for different reasons. The method of data collection also differed between the 2 country samples introducing different biases and reducing the comparability of the Nigeria and UK samples. A postal questionnaire was used to collect quantitative data from the UK sample while a researcher-administered questionnaire was used in the Nigeria study. Both of these methods have their limitations. The response rate for the postal questionnaire was 36%. Participants who responded may have been more interested or in better health than non-responders. It was not possible to compare non-responders and responders to assess whether there were any significant differences between the 2 groups that could potentially bias the study findings (May, 2001). This bias would have been absent from the Nigeria study where 100% of participants approached consented to take part in this research even though they were told that they could refuse to take part if they so desired. However, administration of the questionnaire by the researcher in the Nigeria quantitative study could introduce social desirability bias. Finally, the cardiovascular disease risk profile of the 2 samples differed. All participants in the UK sample were hypertensive, diabetic and overweight. Only a quarter of the Nigeria sample were hypertensive and diabetic. No data was obtained on BMI as this is not routinely collected in Nigeria. Consequently, no direct comparison could be made between the Nigeria and UK samples as they were markedly different.

Limitations of the Nigeria quantitative study (Study 1)

Participants in the Nigeria quantitative study were recruited from hospitals thus may represent a more adherent population than a general population sample. Therefore, they may have better health behaviours and different illness perceptions than members of the general population who do not present to hospital for a myriad of reasons. Consequently, the findings of this study cannot be generalised to an everyday population Nigerians. Data collection in hospitals may have encouraged participants to give responses consistent with medical advice they had received in the past.

Therefore, health behaviours may have been overestimated in this study. In addition, participants had limited time to spend completing the questionnaire because they had other priorities i.e. waiting to see the doctor or pick-up prescriptions or resume daily routines. Thus in some instances, the questionnaire was not fully completed. In many cases, the social support section, which was the final part of the questionnaire was not completed. Consequently, due to the large amount of missing data for this section of the questionnaire, no data on social support was analysed or presented for the Nigerian study sample.

Data collection was not uniform across both research sites. Some participants in the urban site self-administered the questionnaire, whereas the researcher administered all questionnaires in the semi-urban site. Unlike self-administered questionnaires, researcher administered questionnaires are subject to social desirability bias. This inconsistency in data collection may have influenced the results. However, given that less semi-urban dwellers reportedly adopted a low-fat or healthy exercise behaviours, any discrepancy caused by the difference in data collection did not influence the direction of the findings. However the magnitude of the difference may have been underestimated.

Due to unforeseen circumstances, some participants in the urban site received and returned their questionnaires to their doctors. This may have introduced social desirability bias. Efforts were made to diminish this by asking participants to return their filled questionnaires in the sealed envelopes provided. This was the case for only a small proportion of participants as the researcher was present for the bulk of data collection.

Finally, the Nigeria quantitative study had a relatively small sample size thus may not have identified modest associations. However, as previously mentioned it met the minimum requirement to perform a logistic regression.

Limitations of the UK quantitative study (Study 2)

Participants in the UK quantitative study were recruited from a research-ready population and not from the general population. This limits the generalizability of study findings to a general population.

Only 36% of potential participants responded to the survey and were included in the analysis. Participants who responded may have been more interested or in better health than non-responders. It was not possible to compare non-responders and responders to assess whether there were any significant differences between the 2

groups that could potentially bias the study findings (May, 2001). Another limitation of postal questionnaires, is that it is not possible to ensure that the questionnaire was completed by the person for whom it was intended (May, 2001). It is also not possible to ensure that the questionnaire is completed in its entirety. However, missing data analysis was conducted to ascertain whether there was a pattern to missing data or whether data was missing at random.

Finally, only 8 of the quantitative UK study participants were non-statin users. Therefore, a univariate analysis comparing statin users and non-statin users was not deemed feasible. As an alternative, post-hoc analysis was conducted that compared participants based on their dietary status (dietary adopters vs dietary non-adopters) and their exercise status (exercise adopters vs exercise non-adopters). This study had a relatively small sample size thus may not have identified modest associations. However, as previously mentioned it met the minimum requirement to perform a logistic regression.

7.4.2 Limitations of the qualitative study (Study 3)

In-depth interviews are subject to social desirability bias (Walter, 2012). Interviewees may tailor the information they provide to portray a certain impression of themselves e.g. to appear more favourable to the interviewer (Walter, 2012). In addition, interviewees may selectively decide what information to reveal and what to withhold for a myriad of reasons (Walter, 2012). Interviews are also based on recall which influences the accuracy of the information obtained as individuals may knowingly or unknowingly fill in the gaps in their memory (Walter, 2012).

Reliability and validity are important for establishing the quality of qualitative research. Indeed the rigor involved in qualitative research is often a major point of discussion and criticism (Creswell, 2008, Bryman, 2008). The terms reliability and validity in qualitative research differ from their meaning in quantitative research and relate to ideas about the dependability, credibility and transferability of qualitative findings (Bryman, 2008, Creswell, 2008).

Reliability in qualitative research refers to the use of a consistent approach throughout the research process. This can be achieved by cross-checking that transcription of audio interviews is verbatim; the use of clearly defined codes to ensure consistency in the coding process; and cross-checking coding with other researchers to ensure inter-coder agreement (Creswell, 2008). These 3 strategies were employed in this research as previously discussed in the qualitative analysis section.

Validity in qualitative research refers to the accuracy of the research findings obtained (Creswell, 2008). Various strategies can be employed in attempts to validate qualitative findings such as: triangulation, member checking, peer briefing, use of external auditor, and extended time in the research field (Creswell, 2008). None of these strategies were employed in this research because of time constraints. However, the following 3 strategies were employed in this research in an effort to validate the research findings. Firstly, rich descriptions of the themes were presented. Secondly, information that differed from general consensus within and between themes was also presented to paint a more realistic, well-rounded picture of emergent themes (Creswell, 2008). Thirdly, the researcher clarified her bias by discussing the influence of her background on the research process in the reflectivity section presented in the methodology section of chapter 3 (Creswell, 2008).

The researcher was a novice interviewer who had attended courses on in-depth interviewing but whose main practice was in pilot interviews and in participant interviews. Therefore, some opportunities to probe further and obtain richer information from interviewees were missed. This potentially limited the depth of information obtained from interviewees. Finally, the number of interviews conducted was determined by limited time and resources rather than data-saturation.

Limitations of the qualitative study in Nigeria

Due to the quick turnover of patients in the hospitals, it was not possible to analyse the questionnaires before interviews were carried out. Consequently, the researcher had to make a quick decision about which participants to interview by quickly glancing at completed questionnaires. This process was easier in the semi-urban site because all the questionnaires were researcher-administered.

Participants had limited time to spend completing the questionnaire and taking part in interviews. Majority were unable to take part in interviews after completing the questionnaire because they had other priorities i.e. waiting to see the doctor or picking-up prescriptions or resuming their daily routines. This was particularly difficult in the urban site because patients were NNPC staff who had taken a few hours off work or had come in their lunch break to see a doctor and had to immediately return to work. Thus the interviewer was unable to conduct as many interviews as was intended and was often unable to probe or cover all the topics in the interview guide limiting the depth and richness of data obtained.

Interviews were conducted in hospitals unlike in the UK where they were conducted the homes of interviewees. Consequently, Nigerian interviewees may have given

responses consistent with the medical advice they had been given and may have discussed their medical world of high cholesterol more than they would have done otherwise. This may have also caused them to discuss a more medical world of high cholesterol than their UK counterparts. This potentially overestimates the health behaviours of interviewees and overemphasizes their medical world of high cholesterol

Limitations of the qualitative study in the UK

Only statin users expressed an interest in taking part in the UK qualitative study. Nevertheless, this study was still able to explore people's accounts of how statin-use influenced their dietary and exercise behaviours, perceptions of high cholesterol and perceived future risk of cardiovascular disease.

7.5 Contribution of this research to literature

This research is the first to examine the influence of statin-use on the adoption of healthy lifestyle choices in a Nigerian population. This research found that one of the key factors associated with the adoption of healthy lifestyle choices was location. This emphasizes the importance of considering health behaviours and illness perceptions within the social context of the population of interest.

This research identified a preference for the adoption of healthy dietary choices versus the adoption of healthy exercise behaviour. This preference for making dietary changes over exercise changes was fuelled by the attribution of high cholesterol to dietary factors and concerns about the perceived lack of physical ability to perform moderate-vigorous exercise among older adults in the UK.

7.6 Research implications

This research highlights the importance of emphasizing the causal influence of lifestyle factors (dietary and exercise behaviours) and where appropriate medical factors to encourage the inclusion of lifestyle factors in control perceptions and where appropriate statin-use and thus facilitate the adoption of healthy lifestyle choices alongside statin-use. Furthermore, emphasizing the benefits of adopting healthy lifestyle choices for the prevention of cardiovascular disease may help prevent perceived medical control of high cholesterol or faith in God and fatalistic beliefs from diminishing the perceived consequences of high cholesterol.

In regards to health behaviours, the findings of this study suggests that debunking some of the misconceptions about exercise and creating greater awareness of the benefits of low intensity exercise versus sedentary behaviours may encourage older

adults and females to be less sedentary and take part in physical activity. Highlighting age-appropriate exercise strategies may help reduce concerns about sustaining physical injury and the physical limitations or ageing thus encouraging older adults to adopt healthy exercise behaviours to the best of their abilities. Furthermore, strategies that attempts to improve perceived ability to adopt healthy lifestyle choices in females and lifestyle advice that acknowledges the gender differences in: factors that facilitate the adoption of healthy lifestyle choices; dietary and exercise preferences; target setting; and progress monitoring may facilitate the adoption of healthy lifestyle choices.

This research highlights the importance of considering the social world in which health behaviours and illness perceptions exist and tailoring health advice to meet the specifics of the social world or context for which it is intended. Consequently, key findings as well as suggestions for clinical practice and public health interventions for each country i.e. Nigeria and the UK have been proposed and will be presented in Table 7.1 and Table 7.2 respectively.

Key findings	Clinical suggestions	Public health suggestions
Preference for either statin-use or the adoption of healthy lifestyle choices was common.	Discuss and clarify cause-control illness perceptions and perceived relationship between statin-use and the adoption of healthy lifestyle choices before prescription and at routine check-ups.	Encourage endorsement of health lifestyle behaviours alongside statin-use by local celebrities and dignitaries. Radio jingles endorsing the importance of healthy lifestyle choices and medication-use.
Perceived control of high cholesterol by external factors (e.g. faith in God and fatalism) hinders statin-use and lifestyle changes.	Discuss and clarify external control perceptions before prescription and at routine check-ups.	Use of religious groups to educate people about high cholesterol. Use of religious groups to organise physical activity events and healthy cooking activities.
Preference for making healthy dietary changes vs making healthy exercise changes.	Discuss and clarify perceptions of exercise and perceived ability to adopt healthy exercise behaviours. Identify and discuss patient specific exercise strategies.	Encourage endorsement of physical activity by local celebrities and dignitaries. Encourage local institutions and companies to subsidise membership to local sport clubs. Use religious and community groups to set up physical activity events such as community races. Increased physical activity in schools.
Perceived inability to adopt healthy lifestyle choices among females.	Discuss and clarify perceived ability to adopt healthy lifestyle choices before statin prescription and at routine check-ups. Identify and discuss patient specific lifestyle control strategies.	Use of local community groups to organise mother and child exercise groups. After school cooking classes for mothers and children. Encourage local institutions and companies to subsidise membership to local sport clubs.

Table 7.1: Key findings from Nigerian participants alongside clinical and public health suggestions

Key findings	Clinical suggestions	Public health suggestions
Perceived synchronous relationship between statin-use and adoption of healthy lifestyle choices encouraged use of both strategies.	Discuss and clarify perceived relationship between statin-use and the adoption of healthy lifestyle choices before prescription and at routine check-ups.	Encourage the portrayal of a balanced picture of the pros and cons of statin-use in media. Encourage weight loss institutions to highlight long-term sustainable healthy lifestyles rather than a diet or exercise regimes.
Perceived medical control of high cholesterol hinders adoption of healthy lifestyle choices	Discuss and clarify medical control perceptions before prescription and at routine check-ups.	Emphasis statin-use as an adjunct not an alternative. Emphasis lifelong, multiple benefits of healthy lifestyle choices.
Preference for making healthy dietary changes vs making healthy exercise changes.	Discuss causal role of exercise as well as diet on high cholesterol. Discuss and clarify perceived ability to adopt healthy exercise behaviours. Identify and discuss gender and age specific exercise strategies.	Encourage local walking groups for older adults and retirees. Encourage grandparent and grandchildren nature walks. Encourage the idea of being less sedentary rather than more physically active in older adults.
Perceived inability to adopt healthy lifestyle choices among females.	Discuss and clarify perceived ability to adopt healthy lifestyle choices before statin prescription and at routine check-ups. Identify and discuss patient specific lifestyle control strategies.	Encourage household fitness challenges to be shared by all members of home. Encourage weekly maximum household dietary consumption challenges to be shared by all members of home. Encourage more sports facilities with age-specific exercise classes and female groups, highlight social component.

Table 7.2: Key findings from UK participants alongside clinical and public health suggestions.

7.7 Suggestions for future research

More research needs to be done to understand the relationship between statin-use and the adoption of healthy lifestyle choices because this relationship appears to influence health behaviours (medication adherence and/or adoption of healthy lifestyle choices) and thus influences prevention of cardiovascular disease. Ideally further research should involve longitudinal studies with comparable statin and non-statin groups that are able to infer causality and follow the changes in health behaviours, illness perceptions and their complex relationship over time. Furthermore, lifestyle behaviours are influenced by societal norms and constructs that need to be further researched to identify a path of least resistance that encourages the adoption of healthy lifestyle choice worldwide.

References

- Abraham, C. & Sheeran, P. 2005. The Health Belief Model. *In*: CONNER, M. & NORMAN, P. (eds.) *Predicting health behaviour*. 2nd ed. Berkshire, England: Open University Press.
- Abubakari, A.-R. & Bhopal, R. 2008. Systematic review on the prevalence of diabetes, overweight/obesity and physical inactivity in Ghanaians and Nigerians. *Public health*, 122, 173-182.
- Adelufosi, A. O., Abayomi, O. & Mosanyo, J. T. 2012. Medication adherence and quality of life among Nigerian outpatients with schizophrenia. *General hospital psychiatry*, 34, 72-79.
- Adewuya, A. O., Owoeye, O. A., Erinfolami, A., Coker, A., Ogun, O. O., Okewole, A. O., Dada, M. U., Eze, C. N., Bello-Mojeed, M., Akindipe, T. O., Olagunja, A. T. & Etim, E. 2008. Prevalence and correlates of poor medication adherence amongst psychiatric outpatients in South Western Nigeria. *General hospital psychiatry*, 31, 167-174.
- Ali, N. S. 2002. Prediction of coronary heart disease preventive behaviors in women: a test of the health belief model. *Women & health*, 35, 83-96.
- Amole, O., Olaolorun, D. & Odeigah, O. 2013. Body size and abnormal lipids among adult patients at the Baptist Medical centre, Ogbomoso, Nigeria. *African health sciences*, 13, 32-37.
- Anosike, F., Mammah, C., Ojo, J., Ugbede, N., Egwuda, E., Azuwuiké, M. & Maliki, A. 2009. *The best of Nigeria. The Nigerian Country Book: New windows of opportunities.*, Lagos, Nigeria, 1st October Publications LTD.
- Antti, J., Marniemi, J., Risto, H., Merja, R. & Tapani, R. 2002. Effects of Diet and Simvastatin on Serum Lipids, insulin, and Antioxidants in hypercholesterolemic men. A Randomized Controlled Trial. *JAMA: the Journal of the American Medical Association*, 287, 598-605.
- Athyros, V. G. & Mikhailidis, D. P. 2014. Therapy: Caloric and fat intake in statin users. *Nature Reviews Endocrinology*, 10, 450-451.
- Awobusuyi, J., Kukoyi, O., Ibrahim, M. & Atiba, M. 2011. Indices of Kidney Damage and Cardiovascular Disease Risk Factors in a Semiurban Community of Iloye, South-West Nigeria. *International journal of nephrology*, 2011.
- Awosan, J. 2009. *Currents of thought in African sociology and the global community: how to understand research findings in the context of sociological perspectives*, Florida, Universal-Publishers. com.
- Awosan, K., Ibrahim, M., Arisegi, S., Ejimadu, S., Erhiano, E. & Aderahman, A. 2013a. Prevalence of metabolic syndrome and its components among civil servants in a metropolitan city in Northern Nigeria. *Global advanced research journal of medicine and medical sciences*, 2, 238-246.
- Awosan, K., Ibrahim, M., Sabir, A. A. & Ejimodu, P. 2013b. Awareness and prevalence of risk factors of coronary heart disease among teachers and bankers in Sokoto, Nigeria. *Medicine and Medical Sciences*, 4, 335-342.
- Awosan, K. J., Ibrahim, M. T. O., Essien, E. J., Yusuf, A. A. & Okolo, A. C. 2014. Dietary pattern, lifestyle, nutrition status and prevalence of hypertension among traders in Sokoto Central market, Sokoto, Nigeria. *International Journal of Nutrition and Metabolism*, 6, 9-17.
- Awosan, K. J., Ibrahim, M. T. O., Makusidi, M. A., Essien, E. J. & Adeniji, A. 2013c. Impact of intervention on knowledge and risk factors of coronary heart disease among teachers in Sokoto, Nigeria. *International Journal of Medicine and Medical Sciences*, 5, 476-488.
- Bailey, L., Vardulaki, K., Langham, J. & Chamdramohan, D. 2007. *Introduction to Epidemiology*, Berkshire, England., Open University Press.

- Bakari, A., Onyemelukwe, G., Sani, B., Aliyu, I., Hassan, S. & Aliyu, T. 2007. Obesity overweight and underweight in suburban northern Nigeria. *International Journal of Diabetes and Metabolism*, 15, 68-69.
- Barnes, L., Moss-Morris, R. & Kaufusi, M. 2004. Illness beliefs and adherence in diabetes mellitus: a comparison between Tongan and European patients. *The New Zealand Medical Journal*, 117, 1-9.
- Barry, A.-M. & Yuill, C. 2011. *Understanding the sociology of health: an introduction*, London, Sage.
- Bastone, E. C. & Kerns, R. D. 1995. Effects of self-efficacy and perceived social support on recovery-related behaviours after coronary artery bypass graft surgery. *Annals of Behavioral Medicine* 17, 324-330.
- Bauman, A. E., Reis, R. S., Sallis, J. F., Wells, J. C., Loos, R. J., Martin, B. W. & Group, L. P. a. S. W. 2012. Correlates of physical activity: why are some people physically active and others not? *The Lancet*, 380, 258-271.
- Becker, M. H., Haefner, D. P., Kasl, S. V., Kirscht, J. P., Maiman, L. A. & Rosenstock, I. M. 1977. Selected psychosocial models and correlates of individual health-related behaviors. *Medical care*, 15, 27-46.
- Bingham, S. A., Welch, A. A., Mctaggart, A., Mulligan, A. A., Runswick, S. A., Luben, R., Oakes, S., Khaw, K. T., Wareham, N. & Day, N. E. 2001. Nutritional methods in the European prospective investigation of cancer in Norfolk. *Public Health Nutrition*, 4, 847-858.
- Blaha, M. J., Nasir, K. & Blumenthal, R. S. 2012. Statin therapy for healthy men identified as "Increased risk". *JAMA: the Journal of the American Medical Association*, 307, 1489-1490.
- Bordo, S. 1990. *Reading the slender body* [Online]. Available: <http://sites.middlebury.edu/individualandthesociety/files/2010/09/slender.pdf>.
- Botha, K. F., Du Plessis, W. F., Van Rooyen, J. M. & Wissing, M. P. 2002. Biopsychosocial determinants of self-management in culturally diverse South African patients with essential hypertension. *Journal of health psychology*, 7, 519-531.
- Brannon, L. & Feist, J. 2007. *Health psychology : an introduction to behavior and health* Belmont, CA :, Thomson/Wadsworth.
- Braun, V. & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative research in psychology*, 3, 77-101.
- Brewer, N., Chapman, G., Brownlee, S. & Leventhal, E. A. 2002. Cholesterol control, medication adherence and illness cognition. *British journal of health psychology*, 7, 433-447.
- British Nutrition Foundation 2005. *Cardiovascular disease : diet, nutrition and emerging risk factors : the report of a British Nutrition Foundation task force / chaired by Keith Frayn ; edited by Sara Stanner*, Oxford :, Published by Blackwell Pub. for the British Nutrition Foundation.
- Bryman, A. 2008. *Social research methods* Oxford, Oxford University Press.
- Capewell S, Allender, S., Critchley J, Lloyd-Williams F, O' Flaherty M, Rayner, M. & Scarborough, P. 2008. Modelling the UK burden of Cardiovascular Disease to 2020 [online]. London: British Heart Foundation.
- Casula, M., Tragni, E. & Catapano, A. L. 2012. Adherence to lipid-lowering treatment: the patient perspective. *Patient preference and adherence*, 6, 805.
- Central Intelligence Agency. 2015. *Nigeria* [Online]. Available: <https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html> [Accessed 05/10 2015].
- Champion, V. L. 1984. Instrument development for health belief model constructs. *Advances in Nursing Science*, 6, 73-85.

- Chee, Y. J., Chan, H. H. V. & Tan, N. C. 2014. Understanding patients' perspective of statin therapy: can we design a better approach to the management of dyslipidaemia? A literature review. *Singapore medical journal*, 55, 416.
- Chen, S. L., Tsai, J. C. & Lee, W. L. 2009. The impact of illness perception on adherence to therapeutic regimens of patients with hypertension in Taiwan. *Journal of Clinical Nursing*, 18, 2234-2244.
- Chisholm, A., Mann, J., Sutherland, W., Williams, S. & Ball, M. 1992. Dietary Management of Patients with Familial Hypercholesterolemia Treated with Simvastatin. *Quarterly Journal of Medicine*, 85, 825-831.
- Chiuve, S. F., Mccullough, M. L., Sacks, F. M. & Rimm, E. B. 2006. Healthy lifestyle factors in the primary prevention of coronary heart disease among men. Benefits among users and non-users of lipid-lowering and antihypertensive medications. *Circulation*, 114, 160-167.
- Clahrc for South Yorkshire. 2013. *South Yorkshire Cohort* [Online]. Available: <http://clahrc-sy.nihr.ac.uk/south-yorkshire-cohort.html> [Accessed 07/03/13 2013].
- Cobb, M. M., Teitelbaum, H. S. & Breslow, J. L. 1991. Lovastatin efficacy in reducing low-density lipoprotein cholesterol levels on high VS low-fat diet. *JAMA: the Journal of the American Medical Association*, 265, 997-1001.
- Cobb, S. 1976. Social support as moderator of life stress. *Psychosomatic Medicine*, 38, 300-313.
- Cohen, S. & Syme, S. L. 1985. Issues in the study and application of social support. *Social support and health*, 3, 3-22.
- Cooper, A., Lloyd, G., Weinman, J. & Jackson, G. 1999. Why patients do not attend cardiac rehabilitation: role of intentions and illness beliefs. *Heart*, 82, 234-236.
- Cooper, A., Nherera, L., O'flynn, N., Turnbull, N., Robson, J., Camosso-Stefonovic, J., Rule, C., Browne, N., Ritchie, G., Stokes, T., Mannan, R., Brindle, P., Gill, P., Thorogood, M. & Wood, D. 2008. Clinical Guidelines and Evidence Review for Lipid Modification: cardiovascular risk assessment and the primary and secondary prevention of cardiovascular disease. London: National Collaborating Center for Primary Care and Royal College of General Practitioners.
- Coutu, M.-F., Dupuis, G., D'antono, B. & Rochon-Goyer, L. 2003. Illness representation and change in dietary habits in hypercholesterolemic patients. *Journal of behavioral medicine*, 26, 133-152.
- Cramer, J. A., Roy, A., Burrell, A., Fairchild, C. J., Fuldeore, M. J., Ollendorf, D. A. & Wong, P. K. 2007. Medication Compliance and Persistence: Terminology and Definitions. *Value in Health*, 11, 44-47.
- Creswell, J. W. 2008. *Research design : qualitative, quantitative, and mixed methods approaches / John W. Creswell*, Los Angeles, Calif. ; London :, SAGE.
- Critchley, J. & Capewell, S. 2003. Mortality risk reduction associated with smoking cessation in patients with coronary heart disease: a systematic review. *JAMA: the Journal of the American Medical Association*, 290, 86-97.
- Curry, S., Kristal, A. R. & Bowen, D. 1992. An application of the stage model of behaviour change to dietary fat reduction. *Health Education Research*, 7, 95-105.
- Dahiru.T & Ejembi.CI 2013. Clustering of cardiovascular disease risk-factors in semi-urban population in Northern Nigeria. *Nigerian Journal of Clinical Practice*, 16, 511-516.
- Das, P. & Horton, R. 2012. Rethinking our approach to physical activity. *The Lancet*, 380, 189-190.

- De Cock, K. M., Selik, R. M., Soro, B., Gayle, H. & Colebunders, R. L. 1991. For debate. AIDS surveillance in Africa: a reappraisal of case definitions. *BMJ*, 303, 1185-1188.
- Department of Health. 2013. *General Practitioner Physical Activity Questionnaire*. [Online]. Available: <https://www.gov.uk/government/publications/general-practice-physical-activity-questionnaire-gppaq> [Accessed 28th August 2014].
- Diefenbach, M. A. & Leventhal, H. 1996. The common-sense model of illness representation: Theoretical and practical considerations. *Journal of Social Distress and the Homeless*, 5, 11-38.
- Dimatteo, M. R. 2004. Social support and patient adherence to medical treatment: a meta-analysis. *Health Psychology*, 23, 207.
- Dunbar-Jacob, J., Schlenk, E. A. & Caruthers, D. 2002. Adherence in the management of chronic disorders. In: CHRISTENSEN, A. J. & ANTONI, M. H. (eds.) *Chronic physical disorders*. Oxford, UK: Blackwell publishers.
- Dwyer, S. C. & Buckle, J. L. 2009. The space between: On being an insider-outsider in qualitative research. *International journal of qualitative methods*, 8, 54-63.
- Ejim, E., Okafor, C., Emehel, A., Mbah, A., Onyia, U., Egwuonwu, T., Akabueze, J. & Onwubere, B. 2011. Prevalence of cardiovascular risk factors in the middle-aged and elderly population of a Nigerian rural community. *Journal of tropical medicine*, 2011.
- Essien, E. J., Meshack, A. F., Ekong, E., Williams, M. L., Amos, C. E., James, T. M. & Peters, R. J. 2005. Effectiveness of a situationally-based HIV risk-reduction intervention for the Nigerian uniformed services on readiness to adopt condom use with casual partners. *Counselling Psychotherapy and Health*, 1, 19-30.
- European Prospective Investigation of Cancer. 2014. *About EPIC-Norfolk* [Online]. Available: <http://www.epic-oxford.org/> [Accessed 11/03 2015].
- Falola, T. 2001. *Culture and customs of Nigeria*, Westport, USA, Greenwood Publishing Group.
- Federal Ministry of Health. 2014. *National Nutritional Guideline on Non-Communicable Disease Prevention, Control and Management* [Online]. Nigeria. Available: <http://www.health.gov.ng/doc/NutritionalGuideline.pdf>.
- Field, A. 2009. *Discovering statistics using spss: and sex drugs and rock 'n' roll*, London, Sage.
- Gibney, M. J., Margetts, B. M., Kearney, J. M. & Arab, L. 2004. *Public health nutrition*, Oxford, Blackwell Publishing.
- Gochman, D. S. 1997. *Handbook of health behavior research*, New York ; London :, Plenum Press.
- Godoy-Izquierdo, D., López-Chicheri, I., López-Torrecillas, F., Vélez, M. & Godoy, J. F. 2007. Contents of lay illness models dimensions for physical and mental diseases and implications for health professionals. *Patient Education and Counseling*, 67, 196-213.
- Guest, G., Macqueen, K. M. & Namey, E. E. 2011. *Applied thematic analysis*, America, Sage.
- Hagger, M. S. & Orbell, S. 2003. A meta-analytic review of the common-sense model of illness representations. *Psychology and Health*, 18, 141-184.
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U. & Group, L. P. a. S. W. 2012a. Global physical activity levels: surveillance progress, pitfalls, and prospects. *The Lancet*, 380, 247-257.
- Hallal, P. C., Bauman, A. E., Heath, G. W., Kohl, H. W., Lee, I.-M. & Pratt, M. 2012b. Physical activity: more of the same is not enough. *The Lancet*, 380, 190-191.
- Harrison, J. A., Mullen, P. D. & Green, L. W. 1992. A meta-analysis of studies of the health belief model with adults. *Health Education Research*, 7, 107-116.

- Harrison, T. N., Derose, S. F., Cheetham, T. C., Chiu, V., Vansomphone, S. S., Green, K., Tunceli, K., Scott, R. D., Marrett, E. & Reynolds, K. 2013. Primary nonadherence to statin therapy: patients' perceptions. *The American journal of managed care*, 19, e133-9.
- Hekler, E. B., Lambert, J., Leventhal, E., Leventhal, H., Jahn, E. & Contrada, R. J. 2008. Common-sense illness beliefs, adherence behaviours, and hypertension control among African Americans. *Journal of behavioral medicine*, 31, 391-400.
- Helman, C. G. 2007. *Culture, Health and Illness*, London, Hodder Arnold.
- Hertz, J. E. 2013. Self-care. In: ILENE MOROF LUBKIN & PAMALA D. LARSEN (eds.) *Chronic illness : impact and intervention*. 8th ed. ed. Burlington, Mass. :: Jones & Bartlett Learning.
- Hooper, L. & Summerbell, C. 2001. Dietary intake and prevention of cardiovascular disease: systematic review. *British Medical Journal*, 32, 757-763.
- Horne, R., Clatworthy, J. & Hankins, M. 2010. High adherence and concordance within a clinical trial of antihypertensives. *Chronic illness*.
- Hsiao, C.-Y., Chang, C. & Chen, C.-D. 2012. An investigation on illness perception and adherence among hypertensive patients. *The Kaohsiung journal of medical sciences*, 28, 442-447.
- Hunninghake, D., Stein, E. A. & Dujoven, C. 1993. The efficacy of intensive dietary therapy alone or combined with lovastatin in outpatients with hypercholesterolemia. *New England Journal of Medicine*, 328, 1213-1219.
- Iloh, G., Amadi, A., Nwankwo, B. & Ugwu, V. 2011. Obesity in adult Nigerians: A study of its pattern and common primary co-morbidities in a rural Mission General Hospital in Imo State, south-eastern Nigeria. *Nigerian Journal of Clinical Practice*, 14, 212-218.
- Janz, N. K. & Becker, M. H. 1984. The health belief model: A decade later. *Health Education & Behavior*, 11, 1-47.
- Joshi, P. H., Chaudhari, S., Blaha, M. J., Jones, S. R., Martin, S. S., Post, W. S., Cannon, C. P., Fonarow, G. C., Wong, N. D. & Amsterdam, E. 2012. A Point-by-Point Response to Recent Arguments Against the Use of Statins in Primary Prevention. *Clinical cardiology*.
- Kasl, S. 1974. The health belief model and behavior related to chronic illness. *Health education monographs*, 2, 433-453.
- Kim, H. S., Sherman, D. K., Ko, D. & Taylor, S. E. 2006. Pursuit of comfort and pursuit of harmony: Culture, relationships and social support seeking. *Personality and social psychology bulletin*, 32, 1595-1607.
- Koenig, H. G. 2002. AN 83-year-old woman with chronic illness and strong religious beliefs. *JAMA*, 288, 487-493.
- Lett, H. S., Blumenthal, J. A., Babyak, M. A., Strauman, T. J., Robins, C. & Sherwood, A. 2005. Social support and coronary heart disease: epidemiologic evidence and implications for treatment. *Psychosomatic Medicine*, 67, 869-878.
- Leventhal, H., Brissette, I. & Leventhal, E. A. 2003. The common-sense model of self-regulation of health and illness. In: CAMERON, L. D. & LEVENTHAL, H. (eds.) *The self-regulation of health and behaviour*. Routledge.
- Leventhal, H., Diefenbach, M. & Leventhal, E. A. 1992. Illness cognition: using common sense to understand treatment adherence and affect cognition interactions. *Cognitive therapy and research*, 16, 143-163.
- Liu, W. T. 1986. Culture and social support. *Research on Aging*, 8, 57-82.
- Lofgren, I., Greene, G., Schembre, S., Delmonico, M. J., Riebe, D. & Clark, P. 2010. Comparison of diet quality, physical activity and biochemical values of older adults either reporting or not reporting use of lipid-lowering medication. *The Journal of Nutrition, Health & Aging*, 14, 168-172.

- Lytsy, P., Burell, G. & Westerling, R. 2012. Cardiovascular risk factor assessments and health behaviours in patients using statins compared to a non-treated population. *International Journal of Behavioral Medicine*, 19, 134-142.
- Makusidi, M. A., Liman, H. M., Yakubu, A., Isah, M., Jega, R., Adamu, H. & Chijioke, A. 2013. Prevalence of Non-communicable Diseases and its Awareness among Inhabitants of Sokoto Metropolis: Outcome of a Screening Program for Hypertension, Obesity, Diabetes Mellitus and Overt proteinuria. *Arab journal of nephrology and transplantation*, 6, 189-191.
- Mann, D. M., Allegrante, J. P., Natarajan, S., Halm, E. A. & Charlson, M. 2007a. Predictors of adherence to statins for primary prevention. *Cardiovascular drugs and therapy*, 21, 311-316.
- Mann, D. M., Allegrante, J. P., Natarajan, S., Montori, V. M., Halm, E. A. & Charlson, M. 2007b. Dietary indiscretion and statin use. *Mayo Clinic proceedings*, 82, 951-953.
- Mann, D. M. & Natarajan, S. 2007. Inverse relationship between lipid-lowering drugs and saturated fat intake in US adults. *Cardiovascular Drugs and Therapy*, 21, 109-115.
- Maruf, F. A., Ibikunle, P. O. & Raji, N. O. 2014. Relationships Between Transtheoretical Model Stages of Change, Decisional Balance, Self-Efficacy, and Physical Activity Level Among Nigerian Market Vendors. *American Journal of Health Promotion*, 28, e118-e126.
- May, T. 2001. *Social research. Issues, methods and process.*, Buckingham, UK, Open Univeristy Press.
- Meyers, D., Leventhal, H. & Gutmann, M. 1985. Common-Sense Models of Illness; The Example of Hypertension. *Health Psychology*, 4, 115-135.
- Mihaylova, B., Emberson, J., Blackwell, L., Keech, A., Simes, J., Barnes, E., Voysey, M., Gray, A., Collins, R. & Baigent, C. 2012. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. *Lancet*, 380, 581-590.
- Molloy, G. J., Perkins-Porras, L., Bhattacharyya, M. R., Strike, P. C. & Steptoe, A. 2008. Practical support predicts medication adherence and attendance at cardiac rehabilitation following acute coronary syndrome. *Journal of Psychosomatic Research*, 65, 581-586.
- Moore, S. M., Charvat, J. M., Gordon, N. H., Pashkow, F., Ribisl, P., Roberts, B. L. & Rocco, M. 2006. Effects of a CHANGE intervention to increase exercise maintenance following cardiac events. *Annals of Behavioral Medicine*, 31, 53-62.
- Morisky, D. E., Green, L. W. & Levine, D. M. 1986. Concurrent and predictive validity of a self-reported measure of medication adherence. *Medical care*, 67-74.
- Moss-Morris, R., Weinman, J., Petrie, K., Horne, R., Cameron, L. & Buick, D. 2002. The Revised Illness Perception Questionnaire (IPQ-R). *Psychology & Health*, 17, 1-16.
- Mozaffarian, D., Wilson, P. W. F. & Kannel, W. B. 2008. Beyond Established and Novel Risk Factors. *Circulation*, 117, 3031-3038.
- Muhammad, S., Sani, M. U. & Okeahialam, B. N. 2013. Cardiovascular disease risk factors among HIV-infected Nigerians receiving highly active antiretroviral therapy. *Nigerian medical journal: journal of the Nigeria Medical Association*, 54, 185-190.
- Najjar, S. S. & Lakatta, E. G. 2005. Aging of the Heart and Arteries. In: GERSTENBLITH, G. (ed.) *Cardiovascular disease in the elderly*. Totowa, N.J. :: Humana.
- National Bureau of Statistics 2010. The National Literacy Survey. Abuja, Nigeria.

- National Heart Lung & Blood Institute 2002. Third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III): final report. *Circulation*, 106, 3143-3421.
- National Institute for Health and Care Excellence 2014. Cardiovascular disease: risk assessment and reduction, including lipid modification. *NICE guidance*.
- National Institute for Health and Clinical Excellence 2008. Statins for the prevention of cardiovascular events. *Technology Appraisal 94*. London: National Institute of Health and Clinical Excellence.
- National Institute for Health and Clinical Excellence 2010. Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease. *NICE Clinical Guideline 67*. London.
- National Population Commission & Ict Macro 2009. Nigeria Demographic and Health Survey 2008: Key Findings.
- Nigerian Heart Foundation, Federal Ministry of Health & World Health Organisation 2003. Health behaviour monitor among Nigerian adult population.
- Nwaneli, C. 2013. Changing Trend in Coronary Heart Disease in Nigeria. *Afrimedical Journal*, 1, 1-4.
- Nyenwe, E. A., Odia, O. J., Ihekweba, A. E., Ojule, A. & Babatunde, S. 2003. Type 2 diabetes in adult Nigerians: a study of its prevalence and risk factors in Port Harcourt, Nigeria. *Diabetes research and clinical practice*, 62, 177-185.
- Odugbemi, T., Onajole, A. & Osibogun, A. 2012. Prevalence of cardiovascular risk factors amongst traders in an urban market in Lagos, Nigeria. *The Nigerian Postgraduate Medical Journal.*, 19, 1-6.
- Office for National Statistics. 2015. *Population estimates for UK, England and Wales, Scotland and Northern Ireland, Mid-2014*. [Online]. Available: <http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/mid-2014/index.html> [Accessed 10/10 2015].
- Ofori, H. B., Lafreniere, K. D. & Senn, C. Y. 1998. Body image perception among women of African descent: A normative context? *Feminism & Psychology*, 8, 303-323.
- Ogunmola, O. J., Olaifa, A. O., Oladapo, O. O. & Babatunde, O. A. 2013. Prevalence of cardiovascular risk factors among adults without obvious cardiovascular disease in a rural community in Ekiti State, Southwest Nigeria. *BMC Cardiovascular Disorders*, 13, 89.
- Oil Revenue Tracking Initiative. 2014. *Oil producing states* [Online]. Available: <http://oilrevenue.org/index.php/theme1/item/509-oil-producing-states> [Accessed 26th of August 2014].
- Ojji, D., Stewart, S., Ajayi, S., Manmak, M. & Sliwa, K. 2013. A predominance of hypertensive heart failure in the Abuja Heart Study cohort of urban Nigerians: a prospective clinical registry of 1515 *de novo* cases. *European journal of heart failure*, 15, 835-842.
- Ojo, I. A. & Mohammed, J. 2013. Anthropometry and cardiovascular disease risk factors among retirees and non-retirees in Ile-Ife, Nigeria: A comparative study. *Nigerian medical journal: journal of the Nigeria Medical Association*, 54, 160-164.
- Okpechi, I. G., Chukwuonye, I. I., Tiffin, N., Madukwe, O. O., Onyeonoro, U. U., Umezudike, T. I. & Ogah, O. S. 2013. Blood pressure gradients and cardiovascular risk factors in urban and rural populations in Abia State South Eastern Nigeria Using the WHO STEPwise approach. *PloS one*, 8, e73403.
- Oladapo, O., Salako, L., Sodiq, O., Shoyinka, K., Adedapo, K. & Falase, A. 2010. A prevalence of cardiometabolic risk factors among a rural Yoruba south-

- western Nigerian population: A population-based survey—Cardiovascular topics. *Cardiovascular Journal of Africa*, 21, 26-31.
- Olatunbosun, S., Kaufman, J., Cooper, R. & Bella, A. 2000. Hypertension in a black population: prevalence and biosocial determinants of high blood pressure in a group of urban Nigerians. *Journal of human hypertension*, 14, 249-257.
- Oloruntoba-Oju, T. 2007. Body Images, Beauty Culture and Language in the Nigeria, African Context. *Understanding Human Sexuality, 2007 Series*.
- Onwubere, B., Ejim, E., Okafor, C., Emehel, A., Mbah, A., Onyia, U. & Mendis, S. 2011. Pattern of blood pressure indices among the residents of a rural community in South East Nigeria. *International journal of hypertension*, 2011, 1-6.
- Opie, L. & Gersh, B. 2005. *Drugs of the heart*, Philadelphia, Elsevier Saunders.
- Ordinoha, B. & Brisibe, S. 2013. Prevalence of hypertension and its modifiable risk factors amongst traditional chiefs of an oil-bearing community in south-south Nigeria. *Sahel Medical Journal*, 16, 24-27.
- Otekeiwebia, A., Oyeyinka, M., Oderinde, A. & Ivonye, C. 2015. Explanatory Models of Diabetes Mellitus and Glycemic Control among Southwestern Nigerians. *International Journal of Diabetes Research*, 4, 23-30.
- Owen, N., Bauman, A. & Brown, W. 2009. Too much sitting: a novel and important predictor of chronic disease risk? *British journal of sports medicine*, 43, 81-83.
- Pallant, J. 2010. *SPSS Survival Manual. A step by step guide to data analysis using SPSS.*, Berkshire, England, Open University Press. McGraw-Hill Education.
- Pickett, S., Allen, W., Franklin, M. & Peters, R. M. 2013. Illness beliefs in African Americans with hypertension. *Western Journal of Nursing Research*, 1-19.
- Public Health England. 2013. *Health profile* [Online]. Available: <http://fingertips.phe.org.uk/profile/health-profiles/data#page/0> [Accessed 10/10 2015].
- Public Health England. 2014. *Cardiovascular disease profile* [Online]. Available: <http://fingertips.phe.org.uk/profile/cardiovascular/data#page/0/gid/1938132737/pat/15/par/E92000001/ati/112/are/N53> [Accessed 10/10 2015].
- Rainey, N. 1998. Old age. In: TREW, K. & KREMER, J. (eds.) *Gender and psychology*. London: Arnold.
- Redberg, R. F. 2014. Statins and weight gain. *JAMA Internal Medicine*, 174, 1046.
- Rose, G., - 2008. *Rose's strategy of preventive medicine : the complete original text / Geoffrey Rose*, Oxford :, Oxford University Press.
- Rosenstock, I. M. 1974. Historical origins of the health belief model. *Health education monographs*, 2, 328-335.
- Ross, S., Walker, A. & Macleod, M. J. 2004. Patient compliance in hypertension: role of illness perceptions and treatment beliefs. *Journal of Human Hypertension*, 18, 607-613.
- Royer, A. 1998. *Life with chronic illness : social and psychological dimensions / Ariela Royer*, Westport, Conn. ; London :, Praeger.
- Salovey, P. & Rothman, A. J. 2003. *Social psychology of health: Key readings*, Psychology press.
- Sani, M. U., Wahab, K. W., Yusuf, B. O., Gbadamosi, M., Johnson, O. V. & Gbadamosi, A. 2010. Modifiable cardiovascular risk factors among apparently healthy adult Nigerian population-a cross sectional study. *BMC research notes*, 3, 11-18.
- Sarafino, E. P. & Smith, T. W. 2014. *Health psychology: Biopsychosocial interactions*, USA, John Wiley & Sons.
- Sarason, B., Sarason, I. & Pierce, G. 1990. *Social Support: An interactional view*, Florida, Wiley Interscience.

- Scarborough, P., Bhatnagar, P., Wickramasinghe, K., Smolina, K., Mitchell, C. & Rayner, M. 2010. Coronary Heart Disease Statistics 2010 Edition. In: GROUP, B. H. F. H. P. N. (ed.) *Coronary Heart Disease Statistics*. British Heart Foundation.
- Schlenk, E. A. & Hart, L. K. 1984. Relationship between health locus of control, health value, and social support and compliance of persons with diabetes mellitus. *Diabetes care*, 7, 566-574.
- Scully, D. 1998. Sports and Exercise. In: TREW, K. & KREMER, J. (eds.) *Gender and psychology*. London: Arnold.
- Sherborne, C. & Stewart, A. 1991. The MOS Social Support Survey. *Social Science & Medicine*, 32, 705-714.
- Sherwood, N. E. & Jeffery, R. W. 2000. The behavioral determinants of exercise: implications for physical activity interventions. *Annual review of nutrition*, 20, 21-44.
- Stack, R. J., Bundy, C., Elliott, R. A., New, J. P., Gibson, J. M. & Noyce, P. R. 2011. Patient perceptions of treatment and illness when prescribed multiple medicines for co-morbid type 2 diabetes. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 4, 127-135.
- Steer, P. J., Hanssen, N. M., Cooper, M. E., De Zeeuw, D., Heerspink, H. L., Mozaffarian, D., Albert, P. S., Grantz, K. L. & Gardosi, J. 2014. Healthy lifestyle guidelines—are they good enough? *The Lancet*, 2, 765-852.
- Stein, J. A., Fox, S. A., Murata, P. J. & Morisky, D. E. 1992. Mammography usage and the health belief model. *Health Education & Behavior*, 19, 462-447.
- Strecher, V. J., Champion, V. & Rosenstock, I. 1997. The Health Belief Model and Health Behaviour. In: GOCHMAN, D. S. (ed.) *Handbook of health behavior research* New York ; London :: Plenum Press.
- Sugiyama, T., Tsugawa, Y., Tseng, C., Kobayashi, Y. & Shapiro, M. F. 2014. Different time trends of caloric and fat intake between statin users and nonusers among us adults: gluttony in the time of statins? *JAMA Internal Medicine*, 174, 1038-1045.
- Swami, V. 2013. Cultural Influences on Body Size Ideals: Unpacking the Impact of Westernization and Modernization. *European Psychologist*, 20, 44-51.
- Swami, V., Mada, R. & Tovée, M. J. 2012. Weight discrepancy and body appreciation of Zimbabwean women in Zimbabwe and Britain. *Body Image*, 9, 559-562.
- Taylor, F., Ward, K., Moore, T., Burke, M., Davey Smith, G., Casas, J. P. & Ebrahim, S. 2011. Statins for the primary prevention of cardiovascular disease. *Cochrane Database Syst Rev*, 1, 32-35.
- The Independent Newspaper. 2015. *Ethnic groups and geo-political regions in Nigeria* [Online]. Available: <http://dailyindependentnig.com/2014/01/ethnic-groups-geo-political-regions-nigeria/> [Accessed 05/10 2015].
- Thompson, P. & Buchner, D. 2003. Exercise and physical activity in the prevention and treatment of the atherosclerotic cardiovascular disease: a statement from Council on Clinical Cardiology and Council on Nutrition, Physical Activity and Metabolism. *Circulation*, 107, 3109-3116.
- Tolmie, E. P., Lindsay, G. M., Kerr, S. M., Brown, M. R., Ford, I. & Gaw, A. 2003. Patients' perspectives on statin therapy for treatment of hypercholesterolaemia: a qualitative study. *European Journal of Cardiovascular Nursing*, 2, 141-149.
- Toriola, A. L., Dolan, B. M., Evans, C. & Adetimole, O. 1996. Weight Satisfaction of Nigerian Women in Nigeria and Britain: Inter-Generational and Cross-Cultural Influences. *European Eating Disorders Review*, 4, 84-94.
- Tovar, E. G., Rayens, M. K., Clark, M. & Nguyen, H. 2010. Development and psychometric testing of the Health Beliefs Related to Cardiovascular

- Disease Scale: preliminary findings. *Journal of advanced nursing*, 66, 2772-2784.
- Townsend, N., Williams, J., Bhatnagar, P., Wickramasinghe, K. & Rayner, M. 2014. Cardiovascular disease statistics, 2014. In: FOUNDATION, B. H. (ed.). London: British Heart Foundation.
- Turshen, M. 1991. *Women and health in Africa*, Trenton, New Jersey, World African Press.
- Uchendu, E. 2007. Masculinity and Nigerian youths. *Nordic Journal of African Studies*, 16, 279-297.
- Ugwuja, E., Ogbonna, N., Nwibo, A. & Onimawo, I. Overweight and Obesity, Lipid Profile and Atherogenic Indices among Civil Servants in Abakaliki, South Eastern Nigeria. *Annals of Medical & Health Sciences Research*, 3, 8-13.
- Ulasi, I. I., Ijoma, C. K. & Onodugo, O. D. 2010. A community-based study of hypertension and cardio-metabolic syndrome in semi-urban and rural communities in Nigeria. *BMC Health Services Research*, 10, 71-77.
- Unwin, N., Setel, P., Rashid, S., Mugusi, F., Mbanya, J. C., Kitange, H., Hayes, L., Edwards, R., Aspray, T. & Alberti, K. 2001. Noncommunicable diseases in sub-Saharan Africa: where do they feature in the health research agenda? *Bulletin of the World Health Organization*, 79, 947-953.
- Ussher, J. 2000. *Women's health : contemporary international perspectives / edited by Leicester :*, British Psychological Society.
- Van Der Wal, M., Jaarsma, T. & Veldhuisen, V. 2005. Non-compliance in Patients with Heart Failure: How Can We Manage it? *The European Journal of Heart Failure*, 7, 5-17.
- Van Wersch, A. 1998. Health and Illness. In: TREW, K. & KREMER, J. (eds.) *Gender and Psychology*. London: Arnold.
- Vicki, F., Sinclair, F., Wang, H., Dailey, D., Hsu, J. & Shaber, R. 2010. Patients' perspectives on nonadherence to statin therapy: a focus-group study. *The Permanente Journal*, 14, 4.
- Walter, M. 2012. *Social research methods*, Australia, Oxford University Press.
- Weaver, A. J. & Ellison, C. G. 2004. Spirituality. Introduction. *Southern medical journal*, 97, 1191.
- Weiler, R. & Stamatakis, E. 2010. Physical activity in the UK: a unique crossroad? *British journal of sports medicine*, 44, 912-914.
- Weinman, J., Petrie, K. J., Moss-Morris, R. & Horne, R. 1996. The illness perception questionnaire: A new method for assessing the cognitive representation of illness. *Psychology & Health*, 11, 431-445.
- World Health Organisation 2007. *Prevention of cardiovascular disease : guidelines for assessment and management of cardiovascular risk.*, Geneva, World Health Organisation.
- World Health Organisation 2010. Global Status report on noncommunicable disease 2010. In: ALWAN, D. A. (ed.). Geneva: World Health Organisation.
- World Health Organisation. 2011. *Nigeria* [Online]. Available: http://www.who.int/nmh/countries/nga_en.pdf [Accessed 06/11/12.
- World Health Organisation 2014. Global status report on non-communicable diseases 2014. Geneva: World Health Organisation.
- World Health Organisation, World Heart Federation & World Stroke Organization 2011. *Global atlas on cardiovascular disease prevention and control*, Geneva, World Health Organisation.
- Yekeen, L., Sanusi, R. & Ketiku, A. 2003. Prevalence of obesity and high level of cholesterol in hypertension: Analysis of data from the University College Hospital, Ibadan. *African Journal of Biomedical Research*, 6: 129-132.

Appendix A: Search strategy for CSM and high cholesterol

Medline

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <October 09, 2015>

Search Strategy:

-
- 1 illness representation*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (32)
 - 2 illness belief*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (39)
 - 3 illness perception*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (149)
 - 4 illness cognition*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (10)
 - 5 1 or 2 or 3 or 4 (212)
 - 6 (common adj2 sense).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (209)
 - 7 (self adj2 regulat*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1070)
 - 8 6 or 7 (1270)
 - 9 adher*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (12225)

- 10 compl*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (332472)
- 11 9 or 10 (341110)
- 12 hypercholesterolemia*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1291)
- 13 cholesterol.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (12383)
- 14 (cholesterol adj2 (elevat* or increas* or high)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1665)
- 15 12 or 13 or 14 (12978)
- 16 5 or 8 (1453)
- 17 11 and 15 and 16 (2)

Psychinfo

Database: PsycINFO <1806 to October Week 2 2015>

Search Strategy:

-
- 1 hypercholesterolemia.mp. or exp Metabolism Disorders/ (16728)
- 2 cholesterol.mp. or exp Cholesterol/ (6359)
- 3 (cholest* adj2 (elevat* or increas* or high)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] (1225)
- 4 1 or 2 or 3 (22295)
- 5 exp Health Behavior/ or exp Illness Behavior/ or exp Treatment Compliance/ or exp Coping Behavior/ or illness representation*.mp. or exp Self Regulation/ (81523)
- 6 exp Mental Disorders/ or exp Health Attitudes/ or exp Illness Behavior/ or illness belief*.mp. (492484)

- 7 exp Illness Behavior/ or exp Health Attitudes/ or exp Coping Behavior/ or exp Perception/ or illness perception*.mp. (339442)
- 8 exp Cognitions/ or exp Cognition/ or exp Illness Behavior/ or illness cognition*.mp. or exp Coping Behavior/ (98719)
- 9 5 or 6 or 7 or 8 (874576)
- 10 (common adj2 sense).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] (3622)
- 11 (self adj2 regulat*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] (17343)
- 12 10 or 11 (20868)
- 13 4 and 9 and 12 (96)

Embase

Database: Embase Classic+Embase <1947 to 2015 October 16>

Search Strategy:

- 1 exp hypercholesterolemia/ or hypercholesterolemia.mp. (65894)
- 2 exp high density lipoprotein cholesterol/ or cholesterol.mp. or exp cholesterol blood level/ or exp cholesterol/ or exp low density lipoprotein cholesterol/ (356903)
- 3 (cholest* adj2 (elevat* or increas* or high)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (36861)
- 4 1 or 2 or 3 (387338)
- 5 exp patient attitude/ or exp psychological aspect/ or exp coping behavior/ or illness representation*.mp. or exp attitude to health/ (827927)
- 6 exp psychological aspect/ or exp attitude to health/ or illness belief*.mp. (539760)
- 7 exp illness behavior/ or exp perception/ or exp attitude to health/ or illness perception*.mp. or exp coping behavior/ (396254)

- 8 exp attitude to health/ or exp coping behavior/ or exp psychological aspect/ or exp cognition/ or illness cognition*.mp. or exp patient attitude/ (2241166)
- 9 (common adj2 sense).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (3129)
- 10 (self adj2 regulat*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (11307)
- 11 5 or 6 or 7 or 8 (2243350)
- 12 9 or 10 (14339)
- 13 4 and 11 and 12 (18)

Appendix B: Search strategies for CSM and hypertension

Medline

Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <October 16, 2015>

Search Strategy:

-
- 1 hypertens*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (22226)
 - 2 illness perception*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (148)
 - 3 illness representation*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (32)
 - 4 illness belief*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (39)
 - 5 illness cognition*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (10)
 - 6 health belief*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (410)
 - 7 2 or 3 or 4 or 5 or 6 (616)
 - 8 (common adj2 sense).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (211)

9 (self adj2 regulat*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier] (1070)

10 8 or 9 (1272)

11 1 and 7 and 10 (1)

Psychinfo

Database: PsycINFO <2002 to October Week 2 2015>

Search Strategy:

1 exp Blood Pressure/ or exp Coping Behavior/ or hypertens*.mp. (33114)

2 exp Health Attitudes/ or exp Perception/ or exp Illness Behavior/ or exp Coping Behavior/ or illness perception*.mp. (152184)

3 exp Coping Behavior/ or exp Health Behavior/ or exp Illness Behavior/ or illness representation*.mp. or exp Self Regulation/ (43895)

4 exp Treatment Compliance/ or exp Illness Behavior/ or exp Health Attitudes/ or illness belief*.mp. (13924)

5 exp Coping Behavior/ or exp Cognitions/ or exp Illness Behavior/ or exp Cognition/ or illness cognition*.mp. (53755)

6 exp Health Behavior/ or exp Health Attitudes/ or exp Treatment Compliance/ or health belief*.mp. (27420)

7 2 or 3 or 4 or 5 or 6 (206716)

8 (common adj2 sense).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] (1778)

9 (self adj2 regulat*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] (12981)

10 8 or 9 (14675)

11 adher*.mp. (21087)

12 compl*.mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] (371448)

13 11 or 12 (382740)

14 1 and 7 and 10 and 13 (141)

Embase

Database: Embase Classic+Embase <1947 to 2015 October 16>

Search Strategy:

- 1 exp essential hypertension/ or exp hypertension/ or hypertens*.mp. or exp blood pressure/ (1082207)
- 2 exp illness behavior/ or exp perception/ or exp attitude to health/ or illness perception*.mp. or exp coping behavior/ (396254)
- 3 exp patient attitude/ or exp psychological aspect/ or exp coping behavior/ or illness representation*.mp. or exp attitude to health/ (827927)
- 4 exp psychological aspect/ or exp attitude to health/ or illness belief*.mp. (539760)
- 5 exp coping behavior/ or exp psychological aspect/ or exp cognition/ or illness cognition*.mp. or exp patient attitude/ (2200773)
- 6 exp attitude to health/ or health belief*.mp. or exp health belief/ (96769)
- 7 2 or 3 or 4 or 5 or 6 (2247253)
- 8 (common adj2 sense).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (3129)
- 9 (self adj2 regulat*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (11307)
- 10 8 or 9 (14339)
- 11 1 and 7 and 10 (104)

Appendix C: Nigeria preliminary question sheet

Preliminary questions

1. What is your age?

2. What is your gender?

 Male Female

3. What is your height?

 Feet Inches or cm

4. What is your weight?

 kg or stone lbs

5. What is your smoking status?

 I currently smoke I used to smoke
 I have never smoked

6. Do you have diabetes?

 Yes (type 1) No
 Yes (type 2)

7. Are you currently taking medication for high blood pressure?

 Yes No

8. Are you currently taking medication for high cholesterol?

 Yes No

9. Have you had a diagnosed heart attack or stroke?

 Yes No



Appendix D: Nigeria participant information sheet

Participant information sheet

Does taking a statin influence the adoption of healthy lifestyle choices?

You are invited to take part in this research project. Before you decide to take part, please take the time to read the following information. If you wish to ask any questions or find out more about this research, please ask the researcher using contact information provided overleaf.

Purpose of this research

This research aims to investigate whether taking a statin influences the adoption of healthy dietary and exercise choices by changing the way people think about high cholesterol as a risk factor for heart disease.

Do you have to take part?

Taking part in this research is completely voluntary. If you decide to take part you will be given this information sheet to keep and you will be asked to sign a consent form. You have up to 2 weeks after you have filled the questionnaire/taken part in an interview to withdraw from this research without any negative consequences by simply informing the researcher via telephone or email that you are no longer interested in participating, you do not need to give a reason for withdrawal.

What your participation will involve

You will be asked to fill a questionnaire with questions on: your diet and exercise; what you think about high cholesterol; risk of heart disease and social support. It should take about 20-30minutes to fill out the questionnaire. You have been provided with a stamped and return envelope to use to post the completed questionnaire.

At the end of the questionnaire you will be asked to fill in your contact details if you are willing to be further contacted for face-to-face interviews. Some participants will be contacted for follow-up audio recorded interviews which will take approximately 60minutes and a researcher will ask you questions similar to those in the

questionnaire. The audio recording will be transcribed and used for research analysis

All your responses will be confidential

Your name will not be linked with your answers and you will not be identified or identifiable in the report that results from this research. All the information collected during the course of this research will remain confidential and will be used solely for the purpose of this research.

What are the possible disadvantages of taking part?

You may feel uncomfortable discussing what you think about high cholesterol and the future risk of heart disease during the interview. The interview will be conducted in a manner to make sure you don't get upset but if you do, please inform the researcher and the interview will be ended.

What are the possible benefits of taking part?

While there are no immediate benefits of taking part in this research, this project hopes to shed some light on activities that influence the prevention of heart disease in the hope of improving prevention efforts and reducing disability and death from heart disease.

Who is organizing and funding this research?

This is a self-funded PhD research project conducted by Joyce Feyisitan Coker a PhD candidate at The University of Leeds, United Kingdom.

Contact details for further information

Nigerian Collaborator The Secretary NIMR-IRB NIMR, Yaba 08023513399	Nigerian Collaborator Dr Akan Otu Consultant University of Calabar Teaching Hospital akanotu@yahoo.com	Nigerian Collaborator Dr Samuel Gara Consultant NNPC Medical Practice Samgara2000@yahoo.com	Primary Researcher Joyce Feyisitan Coker PhD candidate The University of Leeds bs06jfc@leeds.ac.uk 08075056564
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Appendix E: Nigeria study questionnaire



UNIVERSITY OF LEEDS

An investigation of the impact of taking a statin on the adoption of healthy lifestyle choices

Questionnaire booklet

Instructions

This booklet contains some questions for you to answer. These questions aim to find out what **YOU** think about diet, exercise, high cholesterol and heart disease thus there are no right or wrong answers. It should take about 20-30minutes to complete this questionnaire.

Confidentiality

The responses you provide in this booklet will be kept confidential and anonymous and will only be used for research purposes.

Thank you for sharing your opinion

Section 1: About you

1. What age group do you belong to?

40-49yrs 50-59yrs 60-69yrs 70-79yrs 80+yrs

2. What is your gender?

Male Female

3. How would you describe your ethnicity?

Edo Efik/Ibibio Fulani Hausa
 Ijaw Igbo Kanuri Tiv
 Yoruba Other please specify

.....

4. Which of these qualifications do you have?

Primary education (Common entrance/standard 5 or equivalent)

5+ WASSCE/NECO/GCE/GCSEs or equivalent

Undergraduate university degree or higher degree

Professional qualifications (e.g. ACCA)

None of the above

5. Are you?

Single Married

Separated/divorced Widowed

6. Have you lived on any of the following continents in the past 10years?

America Asia Europe Australia

Section 2: About your diet

1. Please tick the appropriate box on every line

Foods	Average consumption in the last year							
	Once a day	2-3 per day	4-5 per day	6+ per day	Once a week	2-4 per week	5-6 per week	Once a month, less, or never
Meat and Fish								
Beef								
Chicken and other poultry								
Lamb								
Pork								
Liver								
Shellfish (prawns, crabs)								
White fish (stockfish, tilapia, catfish)								
Oily fish (e.g. mackerel, sardines,)								
Dairy products								
Dairy desserts (e.g. Fura nono, yogurt, icecream)								
Cheese (e.g. Mai sHanu)								
Low fat or cottage cheese								
Eggs (1 medium) (boiled, scrambled)								
On bread or vegetables								
Butter								
Margarine (e.g. flora)								

2. What kind of fat do you use most often for frying, roasting or grilling?

- Butter Solid vegetable fat/kulikuli
 Palm oil Margarine
 Vegetable oil None

3. How often do you eat food that was fried at home?

- Daily 2-3 times a week 4-6 times a week 1 a week Never

4. How often do you eat fried food away from home?

Daily 2-3 times a week 4-6 times a week 1 a week Never

5. What type of milk do you use most often?

Full cream (e.g. peak, cowbell) Semi-skimmed
 Skimmed Soya
 None Other please specify

.....

6. How much milk do you drink each day, including tea, coffee, cereal etc?

None 2 cups
 1 cup More than 2 cups

7. Have you ever changed your eating habits to decrease the amount of fat in your diet?

Yes No (skip to question 8)

a) Are you currently limiting the amount of fat in your diet?

Yes No (skip to question 8)

b) How long have you been limiting the amount of fat in your diet?

Less than 30days
 1-6 months
 7-12 months
 Over 1 year

c) Would you say you are now eating a low-fat diet?

Yes No

8. In the past month, have you thought about the change you can make to reduce the amount of fat in your diet?

Yes No

Section 3: Your exercise

1. What type and amount of activity is involved in your work?

	Please tick one box only
I am not in employment (e.g. retired, full-time carer, currently unemployed)	
I spend most of my time at work sitting (e.g. in an office)	
I spend most of my time at work standing or walking but, my work doesn't require much physical effort (e.g. shop assistant, hairdresser, security guard, child minder etc.)	
My work involves physical effort including handling of heavy objects and the use of tools (e.g. plumber, electrician, carpenter, cleaner, hospital nurse, gardener, etc.)	
My work involves vigorous physical activity including the handling of very heavy objects (e.g. construction worker, refuse collector etc)	

a) During the *last week*, how many hours did you spend on each of the following activities?

	None	Some but less than 1 hour	At least 1 hour but less than 3 hours	3 or more hours
Swimming, jogging, aerobics, football, tennis, gym workout etc.				
Cycling (including cycling to work and during leisure time)				
Walking (including walking to work and during leisure time)				
Housework/Childcare				
Gardening				

b) How would you describe your walking pace?

- Slow pace (less than 3mph)
- Steady average pace
- Brisk pace
- Fast pace (over 4mph)

2. Have you ever changed the frequency/intensity of the exercise that you engage in?

Yes No (skip to question 3)

a) Do you currently more exercise than you used to be?

Yes No (skip to question 3)

b) How long have you been increasing the amount of frequency/intensity of the exercise that you engage in?

Less than 30days

1-6 months

7-12 months

Over 1 year

3. In the past month, have you thought about the change you can make to amount of exercise that you engage in?

Yes No

Section 4: You and your statin (please do not answer this section if you are not currently taking a statin)

1. Do you ever forget to take your Statin?

Yes No

2. How many days in the past week have you forgotten to take your Statin?

0-2 days

3-4 days

5-7 days

3. Do you sometimes deliberately choose not to take your Statin?

Yes No

4. When you feel better do you stop taking your Statin?

Yes No

5. Sometimes if you feel worse when you take your Statin, do you stop taking it?

Yes No

Section 5: Your views about high cholesterol

These are statements other people have made about their high cholesterol.

Please show how much you agree or disagree with each of the following statements about your high cholesterol by ticking one of the boxes.

Views about high cholesterol	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Having high cholesterol makes me anxious					
I expect to have high cholesterol for the rest of my life					
I get depressed when I think about my high cholesterol					
I go through cycles when my high cholesterol gets better and worse					
My high cholesterol causes difficulties for those who are close to me					
My high cholesterol has serious financial consequences					
I have the power to influence my high cholesterol					
My high cholesterol is a serious condition					
The course of my high cholesterol depends on me					
My high cholesterol is likely to be permanent rather than temporary					
My high cholesterol is very unpredictable					
My high cholesterol makes me feel afraid					
My high cholesterol makes me feel angry					
My high cholesterol strongly affects the way others see me					
My high cholesterol will improve in time					
My high cholesterol has major consequences on my life					

Views about high cholesterol	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I have a clear picture or understanding of my high cholesterol					
When I think about my high cholesterol I get upset					
What I do determines whether my high cholesterol gets better or worse					
My Statin will be effective in curing my high cholesterol					
My Statin can control my high cholesterol					
The negative effect of my high cholesterol can be prevented/avoided by my Statin					

What do you think caused your high cholesterol?

Possible causes of high cholesterol	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Stress/worry					
Hereditary- it runs in my family					
A germ or virus					
Diet or eating habits					
Chance or bad luck					
Poor medical care in the past					
Spiritual causes					
My own behaviour					
Fate/destiny					
Family problems or worries					
Overwork					
Poor immune system					
Ageing					
Alcohol					
Smoking					
Accident or injury					

Section 6: Your views about heart disease

Please show how much you agree or disagree with each of the following statements

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My chance of getting heart disease are high					
My physical health makes it most likely that I will get heart disease					
I feel that my chances of getting heart disease in the future are good					
There is a good possibility that I will get heart disease					
I worry a lot about getting heart disease					
Within the next year I will get heart disease					
The thought of heart disease scares me					
When I think about heart disease I feel nauseous					
If I had heart disease my career would be endangered					
When I think about heart disease my heart beats faster					
Heart disease would endanger my marriage (or significant relationship)					
Heart disease is a hopeless disease					
My feelings about myself would change if I got heart disease					
I am afraid to even think about heart disease					
My financial security would be endangered if I got heart disease					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Problems I would experience from heart disease would last long					
If I got heart disease it would be more serious than other diseases					
If I had heart disease, my life would change					
Taking a Statin prevents future problems for me					
Making healthy lifestyle choices prevents future problems for me					
I have a lot to gain by taking a Statin					
I have a lot to gain by making healthy lifestyle choices					
I would not be so anxious about heart disease if I was taking a Statin					
I be less anxious about heart disease if I was making healthy lifestyle choices					
It is embarrassing for me to take a Statin everyday					
It is embarrassing for me to make healthy lifestyle choices					
To make healthy lifestyle choices, I have to give up quite a bit					
Making healthy lifestyle choices can be painful					
Making healthy lifestyle choices can be time consuming					
My family/friends would make fun of me for taking a Statin					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My family/friends would make fun of me for making healthy lifestyle choices.					
Making lifestyle changes interferes with my activities					
Taking a Statin requires starting a new habit which is difficult					
Making health lifestyle choices requires starting new habits which is difficult					
I am afraid I would not be able to take a Statin daily					
I am afraid I would not be able to make healthy lifestyle choices.					

Section 7: Your views about the amount of support available to you

1. How many close relatives and friends do you have (people you feel at ease with and can talk to about what is on your mind) please write the number in the box below.

2. How often is each of the following kinds of support available to you if you need it? Please tick one of the boxes on each row.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Someone to help you if you are confined to bed					
Someone you can count on to listen to you when you need to talk					
Someone to give you good advice about a crisis					
Someone to take you to the doctor if you needed it					
Someone who cares for you					
Someone to spend time with					
Someone to give you information to help you understand a situation					
Someone to confide in or talk to about your problems					
Someone to prepare your meals if you were unable to do it yourself					
Someone who is able to advice you					
Someone to help with daily chores if you were sick					
Someone to share your thoughts					
Someone to turn to for suggestions about how to deal with personal problems					
Someone you can trust and rely					

Thank you for sharing your opinion

If you are happy to be contacted to further discuss your views on diet, physical activity, high cholesterol and heart disease please fill out the form overleaf providing your contact details and you will be contacted to arrange a time suitable for you.



Appendix F: Nigeria interview invitation sheet

Invitation to take part in interviews

Title of project: A cross-cultural comparison of the impact of taking a statin on the adoption of healthy lifestyle choices (Phase 1: Nigeria study).

Interviews will last between 30-60mins, will be audio recorded and aims to find out what **YOU** think about high cholesterol, heart disease, diet and exercise. The interview will comprise of questions similar to those asked in the questionnaire. If you would like to find out more about the interviews please [read the interview information sheet provided](#) or ask the researcher

If you would like to take part in interviews please provide your preferred contact details below and a researcher will be in touch to arrange a time and a place that suits you best.

Please note that all the information you provide will remain anonymous and confidential and will be used solely for the purposes of this research.

Please return this form in the small stamped and addressed white envelope provided.

Name

Contact details

(phone/email)

Contact for further information

Joyce F Coker

Leeds Institute of Health Sciences

bs06jfc@leeds.ac.uk 08075056564



Appendix G: Nigeria interview consent form

Consent to take part in a study investigating the impact of taking a statin on the adoption of healthy lifestyle choices.

Please put initial in the box next to all the statements you agree with.

I confirm that I have read and understood the information sheet explaining the above research project.

I have had the opportunity to ask questions about the research.

I understand that my participation is voluntary and I am free to withdraw at any time without any negative consequences and without providing a reason.

I understand that my name will not be linked with the research materials and I will not be identified or identifiable in the report that results from this research.

I give permission for members of the research team to have access to my anonymised responses.

I agree for all data collected from me to be used in relevant future research.

I agree to have my interview audio recorded

I agree to take part in this research project

I have read and understood the information sheet provided. I have also talked it over with the researcher to my satisfaction. I understand that participation is voluntary and I am willing to participate in this research.

Participant

Researcher

Name

Signature

Date

Contact details for further information

Nigerian Collaborator	Nigerian Collaborator	Nigerian Collaborator	Primary Researcher
The Secretary	Dr Akan Otu	Dr Samuel Gara	Joyce Feyisitan Coker
NIMR-IRB	Consultant	Consultant	PhD candidate
NIMR, Yaba	University of Calabar Teaching Hospital	NNPC Medical Practice	The University of Leeds
08023513399	akanotu@yahoo.com	Samgara2000@yahoo.com	bs06jfc@leeds.ac.uk 08075056564

Appendix H: NIMR ethical approval letter


	INSTITUTIONAL REVIEW BOARD	
NIGERIAN INSTITUTE OF MEDICAL RESEARCH		
<small>6, Edmond Crescent Off Murtala Muhammed Way, P.M.B. 2013 Yaba, Lagos. Tel: 01-4823123, 01-7744723, 08050254484, 08033460947 Fax: 01-4823123, 234-1-3425171 E-mail: nimirb@yahoo.com Website: www.nimr-nig.org Secretariat: Room 207, Biochemistry Division, Research Block, NIMR</small>		
18 th June, 2013		
PROJECT TITLE:	A CROSS-CULTURAL COMPARISON OF THE IMPACT OF TAKING A STATIN ON THE ADOPTION OF HEALTHY LIFESTYLE CHOICES	
PROJECT No:	IRB/13/216	
<u>APPROVAL LETTER</u>		
<p>The above named proposal has been adequately reviewed; the protocol and safety guidelines satisfy the conditions of NIMR-IRB, policies regarding experiments that use human subjects.</p> <p>Therefore the study under its reviewed state is hereby approved by Institutional Review Board, NIMR.</p>		
PROF. F. E. OKONOFUA <i>Name of IRB Chairman</i>	 18/6/13 <i>Signature of IRB Chairman & Date</i>	
MRS. O. A. NWOGBE <i>Name of IRB Secretary</i>	 18/6/13 <i>Signature of IRB Secretary & Date</i>	
<p>This approval is given with the investigator's Declaration as stated below; By signing below I agree/certify that:</p>		
<ol style="list-style-type: none">1. I have reviewed this protocol submission in its entirety and that I am fully cognizant of, and in agreement with, all submitted statements.2. I will conduct this research study in strict accordance with all submitted statements except where a change may be necessary to eliminate an apparent immediate hazard to a given research subject.<ul style="list-style-type: none">▪ I will notify the IRB promptly of any change in the research procedures necessitated in the interest of the safety of a given research subject.▪ I will request and obtain IRB approval of any proposed modification to the research protocol or informed consent document(s) prior to implementing such modifications.		

3. I will ensure that all co-investigators and other personnel assisting in the conduct of this research study have been provided a copy of the entire current version of the research protocol and are fully informed of the current (a) study procedures (including procedure modifications); (b) informed consent requirements and process; (c) potential risks associated with the study participation and the steps to be taken to prevent or minimize these potential risks; (d) adverse event reporting requirements; (e) data and record-keeping; and (f) the current IRB approval status of the research study.
4. I will respond promptly to all requests for information or materials solicited by the IRB or IRB Office.
5. I will submit the research study in a timely manner for IRB renewal approval.
6. I will not enroll any individual into this research study until such time that I obtain his/her written informed consent, or, if applicable, the written informed consent of his /her authorized representative (i.e., unless the IRB has granted a waiver of the requirement to obtain written informed consent).
7. I will employ and oversee an informed consent process that ensures that potential research subjects understand fully the purpose of the research study, the nature of the research procedures they are being asked to undergo, the potential risks of these research procedures, and their rights as a research study volunteer.
8. I will ensure that research subjects are kept fully informed of any new information that may affect their willingness to continue to participate in the research study.
9. I will maintain adequate, current, and accurate records of research data, outcomes, and adverse events to permit an ongoing assessment of the risks/benefit ratio of research study participation.
10. I am cognizant of, and will comply with, current federal regulations and IRB requirements governing human subject research including adverse event reporting requirements.
11. I will make a reasonable effort to ensure that subjects who have suffered an adverse event associated with research participation receive adequate care to correct or alleviate the consequences of the adverse event to the extent possible.
12. I will ensure that the conduct of this research study adheres to Good Clinical Practice guidelines

MISS COKER JOYCE
Principal Investigator's Name

Miss Coker Joyce 9/7/13
.....
Principal Investigator's Signature and Date

Appendix I: NNPC approval letter

 www.nnpcgroup.com Telephone: 09 - 46081000	NIGERIAN NATIONAL PETROLEUM CORPORATION CENTRAL BUSINESS DISTRICT, HERBERT MACAULAY WAY, P.M.B 190, GARKI, ABUJA.	Ref. <u>GGM/11/12</u> Date: <u>November 11, 2012.</u>
--	---	--

Joyce Feyistan Coker
Leeds Institute of Health Sciences,
The University of Leeds,
G.04 Charles Thackery Building,
Leeds LS29JL,
UK.

Dear Joyce Coker,

RE: REQUEST TO CARRY OUT DOCTORAL RESEARCH IN NNPC MEDICAL SERVICES

I refer to your letter requesting to carry out your doctoral research in NNPC Medical Services.


I am happy to convey the Medical Division's approval for you to do so.

Please let us know when you have received ethical approval from National Health Research Ethics Committee, Nigeria.

Your contact when you get to NNPC will be Dr. Andrew Ayu and Dr. Samuel Gara.

Best wishes.

Yours sincerely
For: **NIGERIAN NATIONAL PETROLEUM CORPORATION**


Dr. E. A. Bako
GGM MEDICAL SERVICES


BOARD OF DIRECTORS:
Mrs. Diezani Alison-Madueke (Minister of Petroleum Resources/Chairperson), Engr. Andrew L. Yakubu (GMD),
Mr. Danladi I. Kifasi (Perm. Sec., Fed. Min. of Finance), Dr. Peter S. Nmadu (GED, CS), Mr. Bernard O.N. Oti (GED, F&A),
Prof. Olusegun Okunnu (Member), Alhaji Abdullahi Bukar (Member), Mr. Daniel Wadzani (Member),
Mr. Steven Oronsaye (Member), Mr Anthony C. Madichie (Sec. to the Corporation/Legal Adviser).

Appendix J: UCTH approval letter

UNIVERSITY OF CALABAR TEACHING HOSPITAL
P.M.B. 1278
CALABAR, NIGERIA

Chief Medical Director
Dr. Thomas U. Agor
B.Med, SC (Anst), MB, BS, FWACS, FMOOG, FICS

**Director of Administration & Secretary
To Board Management**
G.O. (Dr.) Anibang Ebin Uchikong
LLB, BL, LL.D, ANSAS, MCPSM, FCSA, FCAI



Dr. Queeneth Kalu
MBBCH, DA (WACS), FWACS, DA (WPSA)
Chairman, Medical Advisory Committee

Telephone: 087-232055
087-232408-9

Fax 087-232094

UCTH/LR/DM/16
Our Ref:

29TH August, 2013
.....

Joyce Feysitan Coker
Leads Institute of Health Sciences
University of Leads
G.04 Charter Thackah Building
Leads LS29JL
UK.

Dear Joyce Coker,

**Re: Request to carry out doctoral research in University of Calabar
Teaching Hospital.**


I refer to your letter requesting to carry out your doctoral research in University of Calabar Teaching Hospital.

This hospital is very happy to have you carry out your research here. We are willing to provide you with the necessary logistical support to ensure that you succeed.


Your ethical approval from Nigerian Institute of Medical Research (NIMR), Nigeria has been noted.

Please accept assurance of our support.

Kind regards,



Dr. Akaninyene Otu
Consultant Physician/Lecturer



Appendix K: LIHS/LIGHT/LIMM approval letter

Faculty of Medicine and Health
Research Office

University of Leeds
Worsley Building
Clarendon Way
Leeds LS2 9NL
United Kingdom

☎ +44 (0) 113 343 4361



UNIVERSITY OF LEEDS

23 July 2013

Miss Joyce Coker
Student
Leeds Institute of Health Sciences
G.04, Charles Thackrah Building
University of Leeds, LS2 9JL

Dear Joyce

Ref no: HSLTLM/12/063 R

Title: **A cross-cultural comparison of the impact of taking a statin on the adoption of healthy lifestyle choices (Phase 1: Nigeria).**

I am pleased to inform you that the above research application has been reviewed by the Leeds Institute of Health Sciences and Leeds Institute of Genetics, Health and Therapeutics and Leeds Institute of Molecular Medicine (LIHS/LIGHT/LIMM) joint ethics committee and I can confirm a favourable ethical opinion based on the documentation received at date of this letter and granted subject to the following condition:

- **No research commences until ethical approval has been obtained from the Nigerian Institute of Medical Research (NIMR)** (Please provide confirmation of NMR approval to the committee when it has been received)

<i>Document</i>	<i>Version</i>	<i>Date</i>
Ethical_Review_Form_V3	1	22.04.13
Cover letter	1	22.04.13
full research protocol	1	22.04.13
naija questionnaire 2	1	22.04.13
participant information sheet	1	22.04.13
research protocol for Phase 1 Nigeria	1	22.04.13
Interview_Guide[1]	1	22.04.13
HSLTLM12063R_Reviewer_1_comments[2] with response	1	18.06.13
HSLTLM12063R_Reviewer_2_comments[1] and response	1	18.06.13
UoL ethics consent form Vs 2	2	18.06.13
UoL ethics Interview_Guide Vs 2doc	2	18.06.13
UoL ethics My questionnaire Nigeria Vs 2	2	18.06.13
UoL ethics Participant information sheet Vs 2	2	18.06.13
HSLTLM12063R_Reviewer_2__response_to_applicant[1] pwith applicant response	1	02.07.13

Please notify the committee if you intend to make any amendments to the original research as submitted at date of this approval. This includes recruitment methodology and all changes must be ethically approved prior to implementation. Please contact the Faculty Research Ethics Administrator for further information (fmhuniethics@leeds.ac.uk)

Ethical approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The committee takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes. You will be given a two week notice period if your project is to be audited.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

I wish you every success with the project.

Yours sincerely

A handwritten signature in black ink, appearing to read 'D Shickle', written in a cursive style.

Professor Darren Shickle
Acting Chair, LIHS/LIGHT/LIMM Joint REC, University of Leeds

Appendix L: SYC health questionnaire

Consent Form

Thank you for your answers. These will be combined with thousands of others. What we learn will help us understand how we can improve the health of people living in South Yorkshire.

May we contact you again?

Yes No

May we use the information you provide to look at the benefit of health treatments?

Yes No

May we look at your health records?

Yes No

Please fill in your **forename, surname** and **address** if different to those printed to the left:

Forename (print)

Surname (print)

Address

Postcode

Please fill in your preferred contact details below:

Telephone

Mobile phone*

Email*

*Optional

Signature

Thank you for completing the Health Questionnaire. Please put it in the prepaid envelope and post it to the researchers. **NO STAMP NEEDED.**

If you have any queries or require further information about this study please contact Dr Clare Relton or Dr Joanna Blackburn at ScHARR, University of Sheffield, FREEPOST - SF1314, Sheffield, S1 1AY.

Tel: 0114 222 0796 Email: syc@sheffield.ac.uk Online questionnaire: <http://syc.shef.ac.uk>

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8



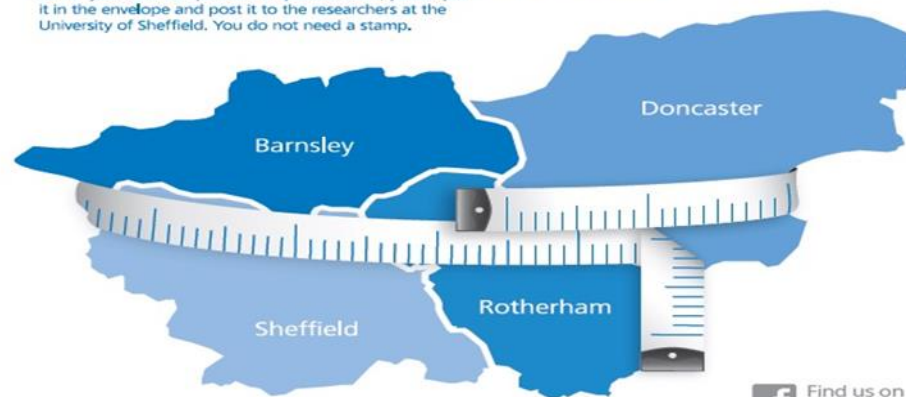
Health Questionnaire

South Yorkshire Cohort

Welcome to the South Yorkshire Cohort! Please help us by filling in this questionnaire. Your answers will help us understand how we can improve the health of people living in South Yorkshire.

The questionnaire will take 5-10 minutes to complete. When you have completed the questionnaire, please put it in the envelope and post it to the researchers at the University of Sheffield. You do not need a stamp.

You can also fill in the questionnaire on Facebook (South Yorkshire Cohort) or by going to: <http://syc.shef.ac.uk> and following the instructions. Please return the questionnaire as soon as you can, ideally within 3 weeks.



NIHR CLAHRC
for South Yorkshire



Sheffield
Hallam University

About you

Your sex Male Female

Your date of birth
d d m m y y y y

How many children do you have (under 18)?

Your height feet inches **OR** cm

Your weight stone lbs **OR** kgs

Your waist measurement inches **OR** cm

Please use the tape measure enclosed and measure at the narrowest point between your hips and your ribs, usually just above the belly button.



Which ethnic group do you belong to?

White

- British
 Irish
 Other white background

Asian or Asian British

- Indian
 Pakistani
 Bangladeshi
 Other Asian background

Mixed

- White and Black Caribbean
 White and Black African
 White and Asian
 Other mixed background

Black or Black British

- Caribbean
 African
 Other Black background

Chinese or other ethnic group

- Chinese
 Other ethnic group

Gypsy / traveller

- Gypsy / traveller

Thinking about your own life and personal circumstances, how satisfied are you with your life as a whole?

Completely Dissatisfied											Completely Satisfied
0	1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You and your work

Are you currently employed? Yes No

The following questions refer to your current main job, or (if you are not working now) to your last main job. Please tick one box only per question.

Employee or self-employed: Do (did) you work as an employee or are (were) you self-employed?

- Employee Self-employed with employees Self-employed / freelance without employees

Number of employees: For employees: indicate below how many people work (worked) for your employer at the place where you work (worked).

For self-employed: indicate below how many people you employ (employed).

- 1-24 25 or more

Supervisory Status: Do (did) you supervise any other employees?

A supervisor or foreman is responsible for overseeing the work of other employees on a day-to-day basis

- Yes No

Occupation

Please tick one box to show which **best** describes the sort of work you do. (If you are not working now, please tick a box to show what you did in your last job). **PLEASE TICK ONE BOX ONLY**

- Modern professional occupations** such as: teacher - nurse - physiotherapist - social worker - welfare officer - artist - musician - police officer (sergeant or above) - software designer
- Clerical and intermediate occupations** such as: secretary - personal assistant - clerical worker - office clerk - call centre agent - nursing auxiliary - nursery nurse
- Senior managers or administrators** (usually responsible for planning, organising and co-ordinating work and for finance) such as: finance manager - chief executive
- Technical and craft occupations** such as: motor mechanic - fitter - inspector - plumber - printer - tool maker - electrician - gardener - train driver
- Semi-routine manual and service occupations** such as: postal worker - machine operative - security guard - caretaker - farm worker - catering assistant - receptionist - sales assistant
- Routine manual and service occupations** such as: HGV driver - van driver - cleaner - porter - packer - sewing machinist - messenger - labourer - waiter/waitress - bar staff
- Middle or junior managers** such as: office manager - retail manager - bank manager - restaurant manager - warehouse manager - publican
- Traditional professional occupations** such as: accountant - solicitor - medical practitioner - scientist - civil/mechanical engineer

During the last 3 MONTHS, how many days have you taken off from paid work as a result of ill health? days

During the last 3 MONTHS, on how many days has your ill health prevented you from carrying out your: Household tasks: days Leisure activities: days

Your health care

In the last 3 MONTHS, how many times have you visited the following:

Hospital	Times	Other carers	Times
Accident & Emergency (A&E)	<input type="text"/>	Counsellor	<input type="text"/>
Hospital - day case	<input type="text"/>	Care worker	<input type="text"/>
Hospital - outpatients	<input type="text"/>	Social worker	<input type="text"/>
Hospital - in-patients (<i>how many nights</i>)	<input type="text"/>	Health visitor	<input type="text"/>
Other healthcare workers	Times	Community health champion	<input type="text"/>
GP	<input type="text"/>	Health trainer	<input type="text"/>
Nurse	<input type="text"/>	Alternative therapist	Times
Physiotherapist	<input type="text"/>	Acupuncturist	<input type="text"/>
Dietitian	<input type="text"/>	Chiropractor	<input type="text"/>
Midwife	<input type="text"/>	Herbalist	<input type="text"/>
Mental health worker	<input type="text"/>	Homeopath	<input type="text"/>
Psychotherapist	<input type="text"/>	Osteopath	<input type="text"/>
Other Please describe:	Times		<input type="text"/>

You and your education

Which of these qualifications do you have?

Please tick all the qualifications that apply, or if not specified, the nearest equivalent:

1+ O Levels / CSE / GCSEs (any grades)	<input type="checkbox"/>	NVQ Level 1, Foundation GNVQ	<input type="checkbox"/>
5+ O Levels, 5+ CSEs (grade 1), 5+ GCSEs (grades A-C), School Certificate	<input type="checkbox"/>	NVQ Level 2, Intermediate GNVQ	<input type="checkbox"/>
1+ A Levels / AS Levels	<input type="checkbox"/>	NVQ Level 3, Advanced GNVQ	<input type="checkbox"/>
2+ A Levels, 4+ AS Levels, Higher School Certificate	<input type="checkbox"/>	NVQ Levels 4-5, HNC, HND	<input type="checkbox"/>
First Degree (e.g. BA, BSc)	<input type="checkbox"/>	Other Qualifications (e.g. City & Guilds, RSA / OCR, BTEC / Edexcel)	<input type="checkbox"/>
Higher Degree (e.g. MA, PhD, PGCE, Post-graduate Certificates / Diplomas)	<input type="checkbox"/>	No qualifications	<input type="checkbox"/>

Your health

Here are some simple questions about your health in general. By ticking one answer in each group below, please indicate which statements best describe your own health state TODAY.

Mobility	Please tick one:
I have no problems in walking about	<input type="checkbox"/>
I have some problems in walking about	<input type="checkbox"/>
I am confined to bed	<input type="checkbox"/>
Self-care	Please tick one:
I have no problems with self-care	<input type="checkbox"/>
I have some problems washing or dressing myself	<input type="checkbox"/>
I am unable to wash or dress myself	<input type="checkbox"/>
Usual Activities	Please tick one:
I have no problems with performing my usual activities (e.g. work, study, housework, family or leisure activities)	<input type="checkbox"/>
I have some problems with performing my usual activities	<input type="checkbox"/>
I am unable to perform my usual activities	<input type="checkbox"/>
Pain / Discomfort	Please tick one:
I have no pain or discomfort	<input type="checkbox"/>
I have moderate pain or discomfort	<input type="checkbox"/>
I have extreme pain or discomfort	<input type="checkbox"/>
Anxiety / Depression	Please tick one:
I am not anxious or depressed	<input type="checkbox"/>
I am moderately anxious or depressed	<input type="checkbox"/>
I am extremely anxious or depressed	<input type="checkbox"/>

Long standing conditions

Do you have any long-standing illness, health problem, condition or disability? Yes No

If yes, please tick all that apply:

Tiredness / Fatigue	<input type="checkbox"/>	High blood pressure	<input type="checkbox"/>
Pain	<input type="checkbox"/>	Heart disease	<input type="checkbox"/>
Insomnia	<input type="checkbox"/>	Osteoarthritis	<input type="checkbox"/>
Anxiety / Nerves	<input type="checkbox"/>	Stroke	<input type="checkbox"/>
Depression	<input type="checkbox"/>	Cancer	<input type="checkbox"/>
Diabetes	<input type="checkbox"/>	Other: (<i>please state</i>)	<input type="checkbox"/>
Breathing problems e.g. chronic bronchitis, asthma or emphysema	<input type="checkbox"/>		

Your health

Alcohol: How many days in the last WEEK did you drink alcohol? days

How many units of alcohol did you drink in the last WEEK? units

A unit of alcohol is equal to ½ a pint of ordinary beer, lager or cider, 1 single measure of spirits, 1 small glass of wine or 1 measure of fortified wine.

Smoking: Which of these best describes you?

- I smoke daily
 I smoke occasionally but not every day
 I used to smoke daily but now not at all
 I used to smoke occasionally but now not at all
 I have never smoked

Your medication

Are you currently taking any medication? (Either prescribed by your doctor, or that you buy yourself).

Yes No

Please list all your medication below, including vitamins & mineral supplements, dietary supplements or diet pills, herbal or homeopathic remedies.

Name & strength of tablet, medicine, ointment, drops, inhaler or injection	Is this prescribed for you? Please tick:	What is this for?
(Example) Co-codamol 3mg/500mg tablets	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Joint pain
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Your exercise and food

During the last WEEK, how many hours did you spend on each of the following activities? (Please tick)

	None	Some but less than 1 hour	At least 1 hour but less than 3 hours	3 hours or more
Physical exercise such as swimming, jogging, aerobics, football, tennis, gym workout etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cycling, including cycling to work and during leisure time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walking, including walking to work, shopping, for pleasure etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Is managing your weight a concern for you? Yes No

Have you ever used any of the following to help you manage your weight? (Please tick)

Exercise and food	
Increasing your exercise	<input type="checkbox"/>
Healthy eating <i>Please describe:</i>	<input type="checkbox"/>
Controlling your portion size	<input type="checkbox"/>
Slimming Clubs	
Slimming World	<input type="checkbox"/>
Weightwatchers	<input type="checkbox"/>
Rosemary Conley Diet and Fitness Club	<input type="checkbox"/>
Lighterlife	<input type="checkbox"/>
Other <i>Please describe:</i>	<input type="checkbox"/>
Over the counter weight loss medication	
Alli (orlistat)	<input type="checkbox"/>
Other <i>Please describe:</i>	<input type="checkbox"/>
Meal replacements	
Lighterlife	<input type="checkbox"/>
Other <i>Please describe:</i>	<input type="checkbox"/>

Appendix M: UK participant information sheet

Questionnaire information sheet

Title of project: A cross-cultural comparison of the impact of taking a statin on the adoption of healthy lifestyle choices (Phase 2: UK study).

If you have high cholesterol, I would like to invite you to take part in this research project. Before you decide to take part, please take the time to read the following information. If you wish to ask any questions or find out more about this research, please ask the researcher using contact information provided overleaf.

Purpose of this research

This research aims to investigate whether taking a statin influences the adoption of healthy dietary and exercise choices by changing the way people think about high cholesterol as a risk factor for heart disease.

Why have you been invited to take part?

You and other members of the South Yorkshire Cohort who have high cholesterol are being invited to take part in this study because your insight will help to shed more light on this topic and help answer the research question.

Do you have to take part?

You can withdraw from this research without any negative consequences by simply informing the researcher via telephone or email that you are no longer interested in participating, you do not need to give a reason for withdrawal.

What your participation will involve

You will be asked to fill a questionnaire with questions on: your diet and exercise; what you think about high cholesterol; risk of heart disease and social support. It should take about 20-30minutes to fill out the questionnaire. You have been provided with a stamped and return envelope to use to post the completed questionnaire.

All your responses will be confidential

Your name will not be linked with your answers and you will not be identified or identifiable in the report that results from this research. All the information collected during the course of this research will remain confidential and will be used solely for the purpose of this research.

What are the possible disadvantages of taking part?

The questionnaire takes about 20-30minutes to complete, however the questionnaire has been kept as short as possible and all questions with the exception of 2 are tick boxes.

What are the possible benefits of taking part?

While there are no immediate benefits of taking part in this research, this study could offer new insights into discussions about the use of statins and their association with health behaviours and help shed some light on activities that influence the prevention of heart disease

What will happen to the results of the research study?

The findings from this study will be reported in a PhD thesis, published in peer-reviewed journals and presented at national and possibly international conferences.

Who is organizing and funding this research?

This is a self-funded PhD research project conducted by Joyce F Coker a PhD candidate at The University of Leeds.

Who has reviewed this research?

This research has been reviewed by a Proportionate Review Sub-Committee of the NHS National Research Ethics Service (NRES) Committee East of England-Cambridge South on the 19th of May 2014.

Contact details for further information

Joyce F Coker

Leeds Institute of Health Sciences

G.02, Charles Thackrah Building

101 Clarendon Road, Leeds, LS2 9LJ

0113 343 6955 bs06jfc@leeds.ac.uk

Appendix N: UK study questionnaire



UNIVERSITY OF LEEDS

An investigation of the impact of taking a statin on the adoption of healthy lifestyle choices

Questionnaire booklet

Instructions

This booklet contains some questions for you to answer. These questions aim to find out what **YOU** think about diet, physical activity, high cholesterol and heart disease thus there are no right or wrong answers. It should take about 30minutes to complete this questionnaire.

Please ensure that you answer all the questions and return the completed questionnaire using the stamped and addressed return envelope provided.

Confidentiality

The responses you provide in this booklet will be kept confidential and anonymous and will only be used for research purposes.

Thank you for sharing your opinion

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UK questionnaire version number: 1
REC reference: 14/EE/0209
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Section 1: About you

1. How old are you?

2. What is your gender?

Male Female

3. How would you describe your ethnicity?

White

Asian

Black

Mixed

English

Indian

African

White and Black
Caribbean

Welsh

Pakistani

Caribbean

White and Black
African

Irish

Bangladeshi

Other

White and Asian

Scottish

Chinese

Other

Other

Other

4. Which of these qualifications do you have?

5+ O Levels/GCSEs or equivalent

2+ A levels or equivalent

Undergraduate University degree or higher degree

Professional qualifications

None of the above

5. Are you?

Single Married Separated/divorced Widowed

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Section 2: About your diet

1. Please tick the appropriate box on every line

Foods	Average consumption in the last year							
	6+ per day	4-5 per day	2-3 per day	Once a day	5-6 per week	2-4 per week	Once a week	Once a month, less, or never
Meat and Fish								
Beef (e.g.roast,steak,beefburgers)								
Chicken and other poultry								
Lamb								
Pork (ham,sausages,bacon)								
Liver								
Fried fish in batter, fish fingers, fish cakes								
White fish (cod, haddock,sole,halibut,plaice)								
Oily fish (mackerel, kippers, tuna,salmon,sardines,herring)								
Dairy products								
Dairy desserts (ice cream, yogurts)								
Cheese (cheddar, brie)								
Low fat or cottage cheese								
Eggs (1 medium)								
On bread or vegetables								
Butter								
Polyunsaturated margarine (flora, sunflower)								

2. What kind of fat do you use most often for frying, roasting or grilling?

- Butter Solid vegetable fat
 Lard Margarine
 Vegetable oil None

3. How often do you eat food that was fried at home?

- Daily 2-3 times a week 4-6 times a week 1 a week Never

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4. How often do you eat fried food away from home?

Daily 2-4 times a week 4-6 times a week 1 a week Never

5. What type of milk do you use most often?

Full cream Semi-skimmed
 Skimmed Soya
 None Other please specify
.....

6. How much milk do you drink each day, including tea, coffee, cereal etc?

None 2 cups
 1 cup More than 2 cups

7. Have you ever changed your eating habits to decrease the amount of fat in your diet?

Yes No (skip to question 8)

a) Are you currently limiting the amount of fat in your diet?

Yes No (skip to question 8)

b) How long have you been limiting the amount of fat in your diet?

Less than 30days
 1-6 months
 7-12 months
 Over 1 year

c) Would you say you are now eating a low-fat diet?

Yes No

8. In the past month, have you thought about the change you can make to reduce the amount of fat in your diet?

Yes No

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Section 3: Your physical activity

1. What type and amount of physical activity is involved in your work?

	Please tick one box only
I am not in employment (e.g. retired, full-time carer, currently unemployed)	
I spend most of my time at work sitting (e.g. in an office)	
I spend most of my time at work standing or walking but, my work doesn't require much physical effort (e.g. shop assistant, hairdresser, security guard, child minder etc.)	
My work involves physical effort including handling of heavy objects and the use of tools (e.g. plumber, electrician, carpenter, cleaner, hospital nurse, gardener, postal delivery worker etc.)	
My work involves vigorous physical activity including the handling of very heavy objects (e.g. construction worker, refuse collector etc)	

a) During the *last week*, how many hours did you spend on each of the following activities?

	None	Some but less than 1 hour	At least 1 hour but less than 3 hours	3 or more hours
Swimming, jogging, aerobics, football, tennis, gym workout etc.				
Cycling (including cycling to work and during leisure time)				
Walking (including walking to work and during leisure time)				
Housework/Childcare				
Gardening/DIY				

b) How would you describe your walking pace?

- Slow pace (less than 3mph) Steady average pace
 Brisk pace Fast pace (over 4mph)

2. Have you ever changed the frequency/intensity of the physical activity that you engage in?

Yes No (skip to question 3)

a) Are you currently more physically active than you used to be?

Yes No (skip to question 3)

b) How long have you been increasing the amount of frequency/intensity of the physical activity that you engage in?

Less than 30days

1-6 months

7-12 months

Over 1 year

3. In the past month, have you thought about the change you can make to amount of physical activity that you engage in?

Yes No

Section 4: You and your statin (please do not answer this section if you are not currently taking a statin)

1. Do you ever forget to take your Statin?

Yes No

2. How many days in the past week have you forgotten to take your Statin?

0-2 days

3-4 days

5-7 days

3. Are you careless at times about taking your Statin?

Yes No

4. When you feel better do you stop taking your Statin?

Yes No

5. Sometimes if you feel worse when you take your Statin, do you stop taking it?

Yes No

Helpful tip

Common names of **statins** are:

- Zocor/simvastatin
- Lipitor/atorvastatin
- Crestor/rosuvastatin
- Lipostat/pravastatin
- Lescol/fluvastatin

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Section 5: Your views about high cholesterol

These are statements other people have made about their high cholesterol.

Please show how much you agree or disagree with each of the following statements about your high cholesterol by ticking one of the boxes.

Views about high cholesterol	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Having high cholesterol makes me anxious					
My Statin will be effective in curing my high cholesterol					
I get depressed when I think about my high cholesterol					
I go through cycles when my high cholesterol gets better and worse					
My high cholesterol causes difficulties for those who are close to me					
The course of my high cholesterol depends on me					
When I think about my high cholesterol I get upset					
My high cholesterol is a serious condition					
I have a clear picture or understanding of my high cholesterol					
My high cholesterol is likely to be permanent rather than temporary					
I have the power to influence my high cholesterol					
My high cholesterol makes me feel afraid					
My high cholesterol makes me feel angry					
My high cholesterol strongly affects the way others see me					
My Statin can control my high cholesterol					
My high cholesterol has major consequences on my life					

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Views about high cholesterol	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My high cholesterol has serious financial consequences					
What I do determines whether my high cholesterol gets better or worse					
My high cholesterol is very unpredictable					
I expect to have high cholesterol for the rest of my life					
My high cholesterol will improve in time					
The negative effect of my high cholesterol can be prevented/avoided by my Statin					

What do you think caused your high cholesterol?

Possible causes of high cholesterol	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Stress/worry					
Hereditary- it runs in my family					
A germ or virus					
Diet or eating habits					
Chance or bad luck					
Poor medical care in the past					
Spiritual causes					
My own behaviour					
Fate/destiny					
Family problems or worries					
Overwork					
Poor immune system					
Ageing					
Alcohol					
Smoking					
Accident or injury					

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Section 6: Your views about heart disease

Please show how much you agree or disagree with each of the following statements

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My chance of getting heart disease are high					
My physical health makes it most likely that I will get heart disease					
I feel that my chances of getting heart disease in the future are good					
There is a good possibility that I will get heart disease					
I worry a lot about getting heart disease					
Within the next year I will get heart disease					
The thought of heart disease scares me					
When I think about heart disease I feel nauseous					
If I had heart disease my career would be endangered					
When I think about heart disease my heart beats faster					
Heart disease would endanger my marriage (or significant relationship)					
Heart disease is a hopeless disease					
My feelings about myself would change if I got heart disease					
I am afraid to even think about heart disease					
My financial security would be endangered if I got heart disease					

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	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Problems I would experience from heart disease would last long					
If I got heart disease it would be more serious than other diseases					
If I had heart disease, my life would change					
Taking a Statin prevents future problems for me					
Making healthy lifestyle choices prevents future problems for me					
I have a lot to gain by taking a Statin					
I have a lot to gain by making healthy lifestyle choices					
I would not be so anxious about heart disease if I was taking a Statin					
I be less anxious about heart disease if I was making healthy lifestyle choices					
It is embarrassing for me to take a Statin everyday					
It is embarrassing for me to make healthy lifestyle choices					
To make healthy lifestyle choices, I have to give up quite a bit					
Making healthy lifestyle choices can be painful					
Making healthy lifestyle choices can be time consuming					
My family/friends would make fun of me for taking a Statin					

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	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My family/friends would make fun of me for making healthy lifestyle choices.					
Making lifestyle changes interferes with my activities					
Taking a Statin requires starting a new habit which is difficult					
Making health lifestyle choices requires starting new habits which is difficult					
I am afraid I would not be able to take a Statin daily					
I am afraid I would not be able to make healthy lifestyle choices.					

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Section 7: Your views about the amount of support available to you

1. How many close relatives and friends do you have (people you feel at ease with and can talk to about what is on your mind) please write the number in the box below.

2. How often is each of the following kinds of support available to you if you need it? Please tick one of the boxes on each row.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Someone to help you if you are confined to bed					
Someone you can count on to listen to you when you need to talk					
Someone to give you good advice about a crisis					
Someone to take you to the doctor if you needed it					
Someone who cares for you					
Someone to spend time with					
Someone to give you information to help you understand a situation					
Someone to confide in or talk to about your problems					
Someone to prepare your meals if you were unable to do it yourself					
Someone who is able to advice you					
Someone to help with daily chores if you were sick					
Someone to share your thoughts					
Someone to turn to for suggestions about how to deal with personal problems					
Someone you can trust and rely					

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Thank you for sharing your opinion

Please return the completed questionnaire using the stamped and addressed return envelope provided.

If you are happy to be contacted to further discuss your views on diet, physical activity, high cholesterol and heart disease please fill out the form overleaf providing your contact details and you will be contacted to arrange a time suitable for you.



Appendix O: UK interview invitation sheet

Invitation to take part in interviews

Title of project: A cross-cultural comparison of the impact of taking a statin on the adoption of healthy lifestyle choices (Phase 2: UK study).

Interviews will last between 30-60mins, will be audio recorded and aims to find out what **YOU** think about high cholesterol, heart disease, diet and exercise. The interview will comprise of questions similar to those asked in the questionnaire. If you would like to find out more about the interviews please read the interview information sheet provided or ask the researcher using the contact information provided below.

If you would like to take part in interviews please provide your preferred contact details below and a researcher will be in touch to arrange a time and a place that suits you best.

Please note that all the information you provide will remain anonymous and confidential and will be used solely for the purposes of this research.

[Please return this form in the small stamped and addressed white envelope provided.](#)

Name

Contact details

(phone/email)

Contact for further information

Joyce F Coker

Leeds Institute of Health Sciences

G.02, Charles Thackrah Building

101 Clarendon Road, Leeds, LS2 9LJ

0113 343 6955 bs06jfc@leeds.ac.uk



Appendix P: UK interview consent form

Interview consent form

Title of project: A cross-cultural comparison of the impact of taking a statin on the adoption of healthy lifestyle choices (Phase 2: UK study).

Name of researcher: Joyce Coker

Please initial all the boxes

I confirm that I have read and understood the information sheet version 1 dated [24th-June-2014] explaining the above research project.

I have had the opportunity to consider the information, ask questions and have had these adequately answered.

I understand that my participation is voluntary and I am free to withdraw at any time without any negative consequences and without providing a reason.

I understand that my name will not be linked with the research materials and I will not be identified or identifiable in the report that results from this research.

I give permission for members of the research team to have access to my anonymised responses.

I agree for all data collected from me to be used in relevant future research.

I agree to have my interview audio recorded

I agree to take part in this research project

I have read and understood the information sheet provided. I have also talked it over with the researcher to my satisfaction. I understand that my participation is voluntary and I am willing to participate in this research.

Participant

Researcher

Name

Signature

Date

Appendix Q: NRES approval letter

Re-issue FIFO, 04 August 2014



Health Research Authority

NRES Committee East of England - Cambridge South

The Old Chapel
Royal Standard Place
Nottingham
NG1 6FS

Telephone: 0115 8839521

21 July 2014

Miss Joyce Coker
G.02 Charles Thackrah Building
University of Leeds
101 Clarendon Road
LS2 9LJ

Dear Miss Coker

Study title:	A cross-cultural comparison of the impact of taking a statin on the adoption of healthy lifestyle choices (Phase 2: UK study).
REC reference:	14/EE/0209
Protocol number:	N/A
IRAS project ID:	136828

Thank you for your letter of 9th July 2014, responding to the Proportionate Review Sub-Committee's request for changes to the documentation for the above study.

The revised documentation has been reviewed and approved by the sub-committee.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the REC Manager Ms Trish Wheat, nrescommittee.eastofengland-cambridgesouth@nhs.net.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Covering letter on headed paper [Response to PO from Joyce F Coker]		08 July 2014
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only)		19 September 2014
Interview schedules or topic guides for participants	1	18 March 2014
Non-validated questionnaire [Questionnaire Booklet]	1	18 March 2014
Other [Interview information sheet]	1	24 June 2014
Other [Invitation to take part in interviews]	2	24 June 2014
Other [Sequence of events]	1	24 June 2014
Participant consent form [For interview]	2	24 June 2014
Participant consent form	1	18 March 2014
Participant information sheet (PIS)	1	18 April 2014
Participant information sheet (PIS) [Questionnaire information sheet]	2	24 June 2014
REC Application Form	136828/6064 76/1/789	07 May 2014
Research protocol or project proposal	2	24 June 2014
Research protocol or project proposal	1	18 March 2014
Summary CV for Chief Investigator (CI)	Kate Hill	16 April 2014
Summary CV for Chief Investigator (CI)	Allan House	
Summary CV for Chief Investigator (CI)	Joyce Coker	29 April 2014

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document “After ethical review – guidance for researchers” gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known

Re-issue FIFO, 04 August 2014

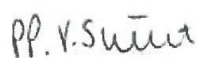
please use the feedback form available on the HRA website:
<http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance>

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at <http://www.hra.nhs.uk/hra-training/>

14/EE/0209	Please quote this number on all correspondence
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With the Committee's best wishes for the success of this project.

Yours sincerely



Dr Leslie Gelling
Chair

Email: nrescommittee.eastofengland-cambridgesouth@nhs.net

Enclosures: *"After ethical review – guidance for researchers"*

Appendix R: Nigeria interview guide

Research aim

This study aims to explore the differences in dietary, exercise behaviours and health beliefs found between statin users and non-users by questionnaires as well as explore the impact of social support cultural and religious factors on taking a statin, dietary and exercise behaviours and health beliefs.

Research objectives

The main objectives are to explore:

- Between group differences in dietary, exercise behaviours and health beliefs between statin users and non-statin users.
- Impact of perceived availability of social support on statin taking, dietary and exercise behaviours.
- Impact of religion on dietary, exercise behaviours, statin taking and social support.
- Impact of cultural factors on dietary and exercise behaviours.

1) Introduction

Aim: to introduce self and research

- Introduce self
- Introduce research
 - Aim
 - Purpose of interview
 - Duration of interview
 - Freedom to withdraw
 - Recording of interview
 - Confidentiality and anonymity
 - Obtain written consent to proceed

RECORDER ON

2) Health beliefs: high cholesterol, CVD risk and religion

Aim: Explore how people think about their high cholesterol and their future risk of CVD and how religion influences these beliefs.

- What do they understand by high cholesterol
 - Source of information
 - Who do they discuss their high cholesterol with and what are the perceptions/opinions of those others.
- What do they think caused their high cholesterol:
 - Medical
 - Lifestyle
 - Religion (pre-destined, evil spirits/bad will, punishment)

- What do they think are the consequences of high cholesterol
 - CVD risk
 - Religion (predestined-fatalism)
- How do they try to control their high cholesterol:
 - Medical control only
 - Religious coping activities (praying, trusting in faith) only
 - Medical and religious coping activities
- If strong treatment control beliefs (from questionnaire)
 - Why (probe reason for confidence in statins)
 - Impact on diet and exercise behaviours (do they think these are more or less relevant/important)
 - Impact on susceptibility to CVD (do they feel more or less susceptible)
- If weak personal control beliefs (from questionnaire)
 - Why (probe for reason for lack of confidence in statins)
 - Impact on diet and exercise behaviours (do they think these are more or less relevant/important)
 - Impact on susceptibility to CVD (do they feel more or less susceptible)

3) Health behaviours: dietary, exercise behaviours, statin taking, social support and culture.

Aim: To explore the impact of social support and culture on dietary, exercise behaviour and taking a statin.

- What changes have they made to manage their high cholesterol
 - Diet/exercise/statins
 - Duration of change
 - Motivation to change (probe impact of high cholesterol/taking a statin)
- Do they have anyone to help them manage their high cholesterol
 - Who
 - What kind of help is provided (emotional, instrumental, informational, companionship)
 - How is the support provided (cooking meals, saying encouraging things etc)
- What do they think are the benefits of making changes to diet, exercise behaviours
 - Health benefits

- Benefits to appearance (perceptions of body image)
- Benefits to others (family and friends)

- What do they think makes it difficult to change dietary and exercise behaviours
 - Cultural perception of body image (perception of self and others)
 - Traditional foods and cooking techniques
 - Food-centred culture (abundant food in family and work environments)
 - Cultural restrictions in exercise clothing and activities
 - Cost
 - Competing priorities

5) Ending interview

Aim: wrap up interview and thank participants.

- Ask if there is anything they would like to mention that hasn't been asked that they think is relevant, or anything they want to elaborate on
- Thank participants for their time, express that they have given you useful information.
- Reassure them of confidentiality and anonymity.

RECORDER OFF

Appendix S: UK interview guide

Research aim

This study aims to explore the differences in dietary, exercise behaviours and health beliefs found between statin users and non-users by questionnaires as well as explore the impact of social support cultural and religious factors on taking a statin, dietary and exercise behaviours and health beliefs.

Research objectives

The main objectives are to explore:

- Between group differences in dietary, exercise behaviours and health beliefs between statin users and non-statin users.
- Impact of perceived availability of social support on statin taking, dietary and exercise behaviours.
- Impact of religion on dietary, exercise behaviours, statin taking and social support.
- Impact of cultural factors on dietary and exercise behaviours.

1) Introduction

Aim: to introduce self and research

- Introduce self
- Introduce research
 - Aim
 - Purpose of interview
 - Duration of interview
 - Freedom to withdraw
 - Recording of interview
 - Confidentiality and anonymity
 - Obtain written consent to proceed

RECORDER ON

2) Health beliefs: high cholesterol, CVD risk and religion

Aim: Explore how people think about their high cholesterol and their future risk of CVD and how religion influences these beliefs.

- What do they understand by high cholesterol
 - Source of information
 - Who do they discuss their high cholesterol with and what are the perceptions/opinions of those others.
- What do they think caused their high cholesterol:
 - Medical
 - Lifestyle
 - Religion (pre-destined-fatalism, punishment, evil spirits/bad will)

- What do they think are the consequences of high cholesterol
 - CVD risk
 - Religion (predestined-fatalism)

- How do they try to control their high cholesterol:
 - Medical control only
 - Diet and/or exercise
 - Religious coping activities (praying, trusting in faith) only
 - Combined approach (medical and diet and/or exercise and/or religion)

- If strong treatment control beliefs (from questionnaire)
 - Why (probe reason for confidence in statins)
 - Impact on diet and exercise behaviours (do they think these are more or less relevant/important)
 - Impact on susceptibility to CVD (do they feel more or less susceptible)

- If weak personal control beliefs (from questionnaire)
 - Why (probe for reason for lack of confidence in statins)
 - Impact on diet and exercise behaviours (do they think these are more or less relevant/important)
 - Impact on susceptibility to CVD (do they feel more or less susceptible)

3) Health behaviours: dietary, exercise behaviours, statin taking, social support and culture.

Aim: To explore the impact of social support and culture on dietary, exercise behaviour and taking a statin.

- What changes have they made to manage their high cholesterol
 - Diet/exercise/statins
 - Duration of change
 - Motivation to change (probe impact of high cholesterol/taking a statin)

- Do they have anyone to help them manage their high cholesterol
 - Who
 - What kind of help is provided (emotional, instrumental, informational, companionship)
 - How is the support provided (cooking meals, saying encouraging things etc)

- What do they think are the benefits of making changes to diet, exercise behaviours
 - Health benefits
 - Benefits to appearance (perceptions of body image)
 - Benefits to others (family and friends)

- What do they think makes it difficult to change dietary and exercise behaviours
 - Cultural perception of body image (perception of self and others)
 - Traditional foods and cooking techniques
 - Food-centred culture (abundant food in family and work environments)
 - Cultural restrictions in exercise clothing and activities
 - Cost
 - Competing priorities

4) Ending interview

Aim: wrap up interview and thank participants.

- Ask if there is anything they would like to mention that hasn't been asked that they think is relevant, or anything they want to elaborate on
- Thank participants for their time, express that they have given you useful information.
- Reassure them of confidentiality and anonymity.
- Ask if they would like to know what the study findings are (dissemination)

RECORDER OFF