Pregnancy outcome in South Asian women: Factors affecting diet and nutrition

by

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A thesis submitted in partial fulfilment for the requirements for the degree of MSc (by Research) at the University of Central Lancashire

April 2012

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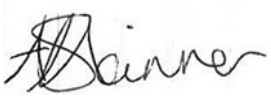
Signature of Candidate  ……..……..

Type of Award **MSc by Research**

School **School of Sports, Tourism and the Outdoors (Sports, Exercise and Nutritional Sciences)**

ABSTRACT

Infants born to women of South Asian origin in England have a lower birth weight than the UK general population (1) and the cause is yet largely unknown but as maternal nutrition can account for up to 5.0% variance in birth weight further investigation is required (2). Social and cultural norms and constraints affect food choice (3) and therefore the factors affecting food choice for pregnant South Asian women also need to be investigated. The objectives of this study were to evaluate the relationship between nutritional intakes from the diet and supplements with birth outcomes in Caucasian and South Asian women living in the UK, and to explore the social and cultural determinates of food choice during pregnancy for South Asian women.

Pregnant women attending the Bradford Royal Infirmary were recruited as part of the Born in Bradford project (4). Five hundred and eleven Caucasian and 651 South Asian women completed a baseline questionnaire to gather data regarding supplement use, sources of nutritional advice during pregnancy and compliance and adherence to the government 5 a day initiative (5). Birth weight data was subsequently collected. Dietary nutrient intakes of South Asian women recruited in Blackburn were assessed by using a 7 day diet diary. Finally 2 focus groups and 7 individual semi-structured interviews were held with South Asian women recruited at a SureStart Centre in Bradford to explore the social and cultural determinates of food choice. Term birth weight was significantly lower for South Asian ($P<0.001$) compared to Caucasian infants. Iron supplementation was significantly associated with increased term birth weight ($P=0.047$) between South Asian women who did and did not take iron supplements during pregnancy but further potential confounding variables would need to be considered before any causal link could be identified. The dietary nutrient intake analysis of non-pregnant South Asian women found that iron, vitamin D, calcium, iodine and selenium intakes were all below the dietary recommended values. Eighteen factors centred around

biology, support networks and cultural and social norms were identified as affecting food choice for pregnant South Asian women. In conclusion, nutritional supplementation during pregnancy does not appear to affect term birth weight with the exception of iron in South Asian women and as iron intake appears to be inadequate in the South Asian diet further investigation in required. Food choice during pregnancy for South Asian women is not only determined by concern for the health of the mother and infant, but it is also underpinned by biological, social and cultural norms as well as the support networks surrounding the women.

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ACKNOWLEDGEMENTS

I would like to say a big thank-you to the many people who have advised, guided and nurtured me through this project.

I would like to say a special thank you to Dr. Nicola Lowe who has given me the opportunity to undertake this project and together with Professor Fiona Dykes as my supervisors have given much of their time, expertise, guidance, encouragement and patients to help me complete this project.

I would also like to thank Dr. Sophie Smailes who helped me to prepare for the qualitative data collection and Pauline Naylor and the staff at the SureStart Childrens Centre who helped me to recruit and hold the focus group and interview sessions.

Thank-you, to the Born in Bradford team, with special thanks to Dr. Pauline Raynor and Professor Neil Small who offered me the opportunity to recruit women for the quantitative data. To all the women recruited on the Born in Bradford project: We are grateful to all the families who took part in this study, to the midwives for their help in recruiting them, the paediatricians and health visitors and to the Born in Bradford team which included interviewers, data managers, laboratory staff, clerical workers, research scientists, volunteers and managers.

I dedicate this thesis to my husband Simon and my daughter Coryn for their total understanding, encouragement and willingness to help while I have been undertaking this project. Thank-you!

ABBREVIATIONS

Any abbreviations should be those in normal use; where necessary a key to the abbreviations should be provided.

For an abbreviation not in common use, the term shall be given in full in the first instance followed by the abbreviation in brackets.

ANOVA	Analysis of Variance
BDA	British Dietetic Association
BiB	Born in Bradford
BMC	Bone Mineral Content
BMD	Bone Mineral Density
BMI	Body Mass Index
BNF	British Nutrition Foundation
BRI	Bradford Royal Infirmary
CHO	Carbohydrate
DOH	Department of Health
FGR	Foetal Growth Restricted
GTT	Glucose Tolerance Testing
IDA	Iron Deficiency Anaemia
IOM	Institute of Medicine
IUGR	Interuterine Growth Restriction
LBW	Low Birth Weight
LRNI	Lower Reference Nutrient Intake
NDNS	National Diet and Nutrition Survey

NSP	Non Starch Polysaccharide
NTD	Neural Tube Defects
RNI	Reference Nutrient Intake
RBC	Red Blood Cells
SD	Standard Deviation
SGA	Small for Gestational Age
WHO	World Health Organisation
WHR	Waist Hip Ratio
UK	United Kingdom
UR	Urban Regeneration
USA	United States of America

COLLABORATION

This thesis and the research conducted within it have been undertaken in collaboration with The Urban Regeneration Project (UR) funded by Hefce, The Born in Bradford Project (BiB) (6) and a study investigating vitamin D intake and status with bone health in South Asian women, funded by the Lancashire Teaching Hospital NHS Trust Research Directorate Seedcorn funding.

The UR and the BiB projects collaborated to bid for funding to undertake the UR study described above. This allowed the BiB project and the UR study to receive funding to collect and report data of mutual interest as well as to have access to data collected separately within each of the projects.

The UR project was set up to address the key challenges of urban regeneration in the northwest of England. One study within the UR project titled ‘’Health Inequalities in South Asian women: Nutrition and pregnancy outcome’’ was designed to explore the social and cultural beliefs surrounding food choices and parenting in South Asian women. Focus groups and individual semi-structured interviews were conducted to collect this data. The focus groups and the individual semi-structured interview analyses are included as part of this thesis. The focus groups and individual semi-structured interviews were jointly planned with Dr Nicola Lowe, Dr Sophie Smailes and Anna Skinner BSc. Anna facilitated the groups and interviews, transcribed the audio recordings and undertook the analysis.

The BiB project was longitudinally studying the causes of childhood illness in Bradford. Supplement used during pregnancy, birth outcome, birth weight, head circumference at

birth and birth anomaly data reported in this thesis were collected as part of the BiB project. Awareness and adherence to the Government 5 a day initiative (5) and sources of nutritional advice during pregnancy were included into the BiB questionnaire as part of the collaboration with The UR Project. Over several months Anna helped the BiB recruitment team to recruit pregnant women and to administer the mothers baseline questionnaire to the women and also to help in the BiB project office. The results of these sets of data were analysed by Anna.

In addition, a project funded by the Lancashire Teaching Hospital NHS Trust Research Directorate and Seedcorn funding was running parallel with the data collection for this study. The project was investigating vitamin D intake and status with bone health in South Asian women and involved collecting dietary intake data, and as dietary data from South Asian women was pertinent to this MSc project this data has been included. Anna met with the participants of this study, took anthropometric measurements, explained the diet diary to the participants and analysed the results.

ORGANISATION OF THE THESIS

This study investigated the factors affecting diet and nutrition in South Asian women and the association this had on pregnancy outcome. This thesis will begin with an introduction describing resent birth outcome data such as infant mortality and birth weight in Bradford. The importance of foetal and maternal nutrition to birth outcomes with reference to specific nutrients and nutritional supplements are discussed as well as a brief introduction to the current diet of South Asian women living in Britain to help highlight possible adequacies and inadequacies in this population. The social and cultural factors affecting food choice are introduced and where possible related to factors particular to pregnancy and to pregnancy in South Asian women. Finally the aims and objectives for this study will be presented.

The methods section in this thesis is divided into 3 main parts, each describing the data collected within each collection method. Supplement use, birth outcome data, adherence to the 5 a day government initiative and sources of nutritional advice that were collected by a baseline questionnaire are described first, followed by the methods for the dietary intake nutrient analysis of South Asian women in the UK. Finally the methods for the social and cultural factors affecting food choice, collected by two focus groups and seven individual semi-structured interviews are given.

The results are reported over 5 separate chapters. Chapter 3 reports the results for the birth outcome data, adherence to the 5 a day government initiative, sources of nutritional advice and supplement use during pregnancy data. Chapter 4 reports the results for the dietary intake nutrient analysis of the South Asian women and chapters 5 & 6 report the social and cultural factors affecting food choice from the analysis of focus groups 1, 2 and the individual semi-structured interviews respectively.

Finally a discussion drawing the key points of the analysis with findings from the literature have been given with final concluding remarks.

CHAPTER 1

INTRODUCTION

1.1 Birth Rates in England and Bradford

Birth weight is an indicator of health for a new born baby and a low birth weight can indicate illness as well as poor maternal nutrition for which there may be many causes. In England, infants born to women of South Asian origin have a lower birth weight than the United Kingdom (UK) general population (1) and this is evident in women of South Asian origin born both in and outside the UK (7). The cause is yet largely unknown but as maternal nutrition can account for up to 5.0% variance in birth weight further investigation is required (2).

In 2002 the Bradford Metropolitan District had the second highest infant mortality rate in the country (8). During the years 1996-2003 for every 1000 babies born alive, 9.0 died before reaching their 1st birthday compared to this being 5.4 per 1000 in England and Wales (9). Both nationally and in Bradford, mothers born in Pakistan have a significantly higher infant mortality rate than those mothers who were born in the UK (8) of 12.9 and 7.1 per 1000 live births respectively (9). Similarly Bangladeshi mothers have a higher rate of infant mortality than UK born mothers of 9.5 and 7.2 per 1000 live births respectively (8). The reason for this is as yet largely unknown.

In addition higher incidences of low birth weights (LBW) have been identified in infants born to mothers from Pakistan and also in mothers that were second and third generation British born (7). A similar trend has been observed in Bradford, where a higher prevalence of babies born to families of South Asian origin have a lower birth weight, compared to those children born to Caucasian families. Between 1996 and 2003

the incidence of low birth weight (babies weighing <2500g at birth) was 9.7% in Bradford compared to 7.5% in England and Wales (9).

Bradford has a diverse multi ethnic population. The last census in April 2001 showed Bradford's ethnic population categorisation to be 78.27 White, 18.9 Asian or Asian British, 1.48 Mixed, 0.93 Black or Black British and 0.42 Chinese or other compared to 90.92, 4.58, 1.31, 2.30 and 0.89 respectively for England (10). This study will refer to the White population as Caucasian and the Asian and Asian British population as South Asian. This ratio of Caucasian to other ethnic populations specifically the South Asian population, offers an invaluable opportunity to access a multi ethnic cohort for this study to determine if nutrition during pregnancy has any association with adverse birth outcomes and to determine any social or cultural factors affecting food choices.

1.2 Foetal and Maternal Nutrition

When considering nutritional practices during pregnancy and the subsequent health of the offspring, nutritional intake from the pre-conception period through to the birth of the baby should be considered, as developmental abnormalities can occur during the first few weeks of pregnancy.

From conception, the embryo and resulting foetus is dependent upon its mother for all nutritional requirements until birth. During pregnancy, maternal nutrition is required not only to supply the foetus with nutrients for growth and development, but also to develop a healthy placenta, to increase red blood cells (RBC) and to increase breast tissue and fat storage, (11) to ensure the survival of the mother and her baby through pregnancy, birth and the lactation period.

Foetal development is a 38 week period of rapid growth, where the weight of the conceptus through to a full term foetus increases six billion times. A continuous supply of energy and nutrients is required for this through maternal nutrition and it is thought that 45% of birth weight is influenced by maternal nutrition and 25% is influenced by maternal age, height, pre-pregnancy weight and genetics or ethnic background (12). Maternal malnutrition however, interferes with placental growth and blood flow through the placenta (12). Pre-pregnancy nutrition should consist of a healthy balanced diet, and should limit alcohol to one or two units on one or two occasions a week, and should follow the pregnancy dietary guidelines for caffeine and fish consumption. This along with folic acid supplementation of 400mg/d should reduce risks of developmental malformations to the embryo before a pregnancy may be confirmed (13).

1.3 Nutrient guidelines during pregnancy

During pregnancy the development of the maternal tissues, the rapid growth of the foetus and the building up of nutrient stores for lactation along with the mothers' usual nutrient requirements, necessitates an increase in her nutrient intakes during pregnancy. The British Nutrition Foundation (BNF) advises an increase in energy and thiamin intake during the third trimester along with riboflavin, vitamin A, C, D and folate intakes throughout pregnancy; there is no recommended increase for minerals (14). While energy intake is only marginally increased during pregnancy, vitamin requirements are increased from early pregnancy highlighting that quality not quantity of diet is important. Much of the additional nutrient requirements are expected to be supplied by the diet alone, although supplementation use is recommended for folic acid and vitamin D (15). To help achieve the increased nutrient requirements, gastrointestinal motility slows allowing increased absorption of nutrients (11).

1.4 Inadequate Maternal nutrient intake

If the maternal diet in the peri-conceptual period or during pregnancy is inadequate not only is the unborn baby's health at risk but so is the mothers. An inadequate maternal diet can often leave the mothers depleted because the foetal requirements are prioritised above those of the mother (16) and if a women has multiple pregnancies in quick succession the risk of nutritional deficiency also increases as stores depleted during pregnancy have had little time to recover before the subsequent pregnancy commences. This could make providing adequate nutrition to subsequent foetus's more difficult. A deficit of energy intake is easily detectable by maternal weight loss or low weight gain during pregnancy, however a deficiency in micronutrients is often asymptomatic until the deficiency is severe and undiagnosed is potentially dangerous for the foetus (16).

1.5 Energy requirements during pregnancy and adverse pregnancy outcomes

For pregnant women who are free from illness, have a balanced healthy diet and a healthy body mass index (BMI) energy intake increases only during the last 3 months of pregnancy by 200kcal/d (17). This increase accounts for the additional energy required for placental and foetal development, maternal weight gain, increased basal metabolic rate and the increased energy expenditure required to move around an increasing body mass (12). Also taken into account is the decrease in activity especially during the later stages of pregnancy when most women become more sedentary (17). However the 200kcal/d increase may not be suitable for all women as some women commence pregnancy being over or under weight, and some women are more active during pregnancy. Monitoring maternal weight gain could provide a better indication of whether energy intakes are adequate. A weight gain of 12.5kg is recommended for a women of normal pre-pregnancy weight (17) and the Institute of Medicine (IOM) recommends a weight gain between 11.5 – 16kg. A study investigating pre-pregnancy

BMI, pregnancy weight gain and its associations with preterm delivery, concluded that a low pregnancy weight gain of <0.5lb/week increases the risk of preterm delivery for previously underweight or normal weight women. The risk was still present although not as severe for women previously overweight or obese (18).

1.6 Micronutrient requirements during pregnancy and adverse pregnancy outcomes.

1.6.1 Folic Acid and pregnancy outcomes.

Folate is involved with DNA synthesis, a deficiency, therefore gives rise to abnormal cell division, highlighting the importance of an adequate supply to the blastocyst, embryo and young foetus (19), when cell division and organogenesis is most prolific. Other folate dependent processes contribute to increasing red cell mass and growth of the placenta and uterus during pregnancy, and folate deficiency can therefore impair cellular growth in the foetus and placenta increasing the risk of neural tube defects (NTD), spontaneous abortion, preterm delivery or inter-uterine growth retardation (IUGR) (19). NTDs involve an incomplete development of the brain or the spinal cord and/or their coverings. There are 3 different types of deformity; anencephaly and encephalocele where parts of the brain are exposed and infants are unlikely to survive, and spina bifida where a part of the spinal column remains open (12). However, because the neural tube is developed and closes along 5 separate sites between 18 and 28 days post ovulation (20) (often before the mother is unaware of her pregnancy), all women of child bearing age who are capable of becoming pregnant or those planning for a pregnancy are advised to supplement their diet with 400µg/d prior to conception. Deficiencies in folate do not only affect foetal development during the first trimester; Lindblad et a (2005) reported that women delivering IUGR infants, had less than half

the blood folate level compared to women delivering normal weight infants, and cord blood of IUGR infants at term showed only half the folate level of normal weight infants. Interestingly, the significant correlation between maternal folate and cord blood folate normally observed in normal weight infants became weaker or disappeared with IUGR infants in this study, suggesting that a folate deficiency can cause placental dysfunction. An association between decreased levels of folate during the third trimester and an increase of the occurrence of IUGR was also reported (21).

The average intake of folate and folic acid (the synthetic form of folate) in food and supplements for 19-64 year old women in the UK is 264µg/d (22). The current UK recommendation for folate intake during the first 12 weeks of pregnancy is 700µg/day; 300µg/d of which should come from food items rich in folate or folic acid and 400µg/d in supplement form (23). A folate intake of <240µg/d has been associated with a > 3 fold increase of low birth weight and pre term delivery (19) and therefore an intake of 300µg/d from the diet is recommended for the remainder of the pregnancy (24). As this is still more than the average women eats pre-pregnancy, pregnant women should choose foods on a daily basis which are high in folate or folic acid.

1.6.2 Iron and pregnancy outcomes

Iron requirements during pregnancy are increased for the development of the growing placenta and the foetus. However in the UK there is no dietary increase mainly because iron normally lost through menstruation which ceases during pregnancy, provides the additional iron to meet the requirements along with a slowing of gastro intestinal motility to allow more iron to be absorbed from the diet. Pregnant women are however recommended to consume plenty of foods rich in iron such as red meat, fortified breakfast cereals, green vegetables, beans, pulses and breads to ensure an adequate

supply (14, 17). The reference nutrient intake (RNI) for iron is 14.8mg/d for women, and on average, women consume 11.8mg/d in food and supplements, however around 20% of 19-64 years olds have an iron intake below the lower reference nutrient intake (LRNI) of 8mg/d (22). The WHO defines iron deficiency anaemia (IDA) as a haemoglobin concentration of 12g/dL in women. In the UK 8% of women have iron deficiency anaemia (25). During pregnancy women often become anaemic because their iron intake prior to pregnancy has been low resulting in poor iron stores. Infants born to mothers who are iron deficient are not always iron deficient themselves, as the needs of the foetus is prioritised over that of the mother (12) however recent research has indicated that IDA during the 1st and 2nd trimester of pregnancy can increase the risk of LBW infants and pre term delivery (26).

1.6.3 Vitamin A and pregnancy outcomes

During pregnancy vitamin A intake is increased by 10µg/d, taking the RNI up to 610µg/d (14) and it is advised that this increase should be met by consuming a balanced diet. Vitamin A in the form of retinol can in high doses be teratogenic to the foetus, increasing birth defects to the head, heart, brain or spinal cord. Vitamin A is fat soluble, therefore the body can store excess vitamin A in the adipose tissues and in the liver. Maternal body stores along with a high dietary retinol intake can be harmful for the foetus. For this reason, foods which are high in retinol, particularly liver should be avoided during pregnancy, to prevent the foetus becoming exposed to excessive circulating retinol levels. Other food sources such as fatty fish can be consumed but only in moderation; no more than 2 portions are recommended and sources such as eggs, milk, cream and butter should be consumed within a healthy balanced diet. Vitamin A and cod liver oil supplements should not be taken during pregnancy, and any multivitamins should be checked to ensure they do not contain vitamin A in the form of

retinol. Many multivitamin supplements have now exchanged retinol for beta-carotene (27), which is one of the plant based precursors to vitamin A and typically found in red and green vegetables such as apricots, carrots, pumpkin, sweet potatoes and green leafy vegetables. Beta-carotene is not toxic to the foetus and therefore can be safely consumed during pregnancy. A study investigating teratogenicity of high vitamin A intakes, estimated that women who take 10,000IU or 250µg/d of vitamin A in supplement form, have a 1 in 57 chance of having a baby born with a birth defect attributed to a high vitamin A intake, and the study data indicated that vitamin A levels not far above the current recommendations could have teratogenic effects (27). However another study investigating peri-conceptual vitamin A intakes and teratogenic effects found that supplemental doses of 200µg to 250µg/d had no association with teratogenic effects on the foetus, and that the minimum level of vitamin A required to produce teratogenic effects appears to be well above that consumed during the peri-conceptual period (28).

1.6.4 Vitamin C and pregnancy outcomes

There is an increase in the recommendation of vitamin C intakes of 10mg/d during pregnancy taking the RNI up to 50mg/d (14, 28). Women are able to achieve this through their diet alone as long as they consume and variety of fruit and vegetables throughout the day. Using the ‘’5 a day’’ guideline during pregnancy will help to achieve a good fruit and vegetable consumption (15). Vitamin C is a water soluble vitamin meaning that it is not stored within the body, but used when it is in circulation and excreted when there is an overabundance. At times of increased requirement such as during pregnancy, consumption should be increased to ensure an adequate and continuous supply of vitamin C for optimum health of the mother and her foetus. Vitamin C is specifically required for synthesis and maintenance of collagen which is a

major component of the chorioamnionic membrane, and low vitamin C levels have been associated with premature rupture of the membrane sometimes causing premature delivery (12).

1.6.5 Calcium and pregnancy outcomes

The foetal skeleton begins to calcify at around 8 weeks of gestation and by 40 weeks 98% of the stored calcium in the foetus is in the bone. This equates to around 30g of calcium (12). In the UK there is no increase in the RNI for pregnant women (14), however a diet containing adequate calcium is recommended (17). To meet the increased calcium requirement, changes in hormones during pregnancy increases absorption, renal calcium retention is enhanced and parts of the bone matrix can be broken down and the calcium released will be reabsorbed into the blood stream to provide for the foetus. It is estimated that the average decrease in maternal bone mineral density (BMD) during pregnancy is between 1 - 4% in women living in Britain (29). Additional risks could be for subsequent pregnancies where conception occurs within 1 year after birth. It has been demonstrated that bone mineral content (BMC) is greater 12 months postpartum than just after delivery (30). While peak bone mass in adulthood is thought to depend on bone mineralisation during the first two decades of life, a variance still exists which cannot be explained by genetic factors or the social environment and it has been suggested that growth patterns in-utero may explain this variance (31). Beltrand et al (31) conducted a study to determine the role of birth weight and foetal growth restrict ion (FGR) on BMC and they concluded that not only small for gestation age (SGA) infants but also FGR infants (even if they were within the normal range of birth weight, but had not reached their genetic potential growth) had a reduced BMC. This indicates that birth weight alone cannot determine a low BMC but that intrauterine events can affect bone mineralisation and growth even in normal birth weight babies. Availability

of calcium to the foetus is thought to affect foetal BMC, and a study assessing BMC at birth with a calcium supplemented and a placebo group found that mothers who had a low dietary calcium intake could improve the BMC of their infant with supplementation whereas no difference in BMC was found in the group with an adequate supply of dietary calcium (32).

1.6.6 Vitamin D and pregnancy outcomes

Ninety percent of calcitriol is derived from cholecalciferol synthesised in the skin (33) from direct sunlight therefore it does not have a RNI for the general population. A RNI of 7-8.5µg/d exist for infants and children up to 3 years of age and 10µg/d for pregnant women (14). Infants are born with stores of vitamin D which lasts until about 9 months of age when vitamin D from the diet and sunlight is required (33). An inadequate supply of vitamin D in-utero, may be associated with adverse pregnancy outcomes such as miscarriage, preeclampsia and premature birth (34) as new evidence shows that vitamin D helps with placental development and function (35). Darker skinned people living at latitudes higher than 42 degrees where sunlight is too weak to synthesis vitamin D from October through to March are at particular risk vitamin D deficiency during winter months (33); this includes the whole of the UK. For adults a level of serum 25(OH)D (the active form of vitamin D synthesized from UV sunlight) below 25nmol/L is classified as being at risk for deficiency relative to bone health (36). No level for sufficiency has been established in the UK but a recent review in the United States of America (USA) suggested a serum 25(OH)D level of 50nmol/L to ensure practically all persons are sufficient (37). A recent study also found that a seasonal variances exits between different races. Serum 25(OH)D was lowest during the spring months for White women and their offspring's cord blood while this was lowest during the winter months for Black women and their offspring's cord blood. Overall Black women had a

significantly lower 25(OH)D serum concentration than White mothers. However, seasonal variance was greater for the White women and their neonates than Black women and their neonates, with a 76% increase in vitamin D deficiency between summer and spring for White neonates and 21% between summer and winter born Black neonates (34). A possible reason for this lack of seasonal effect, may be that Black women gain less of their vitamin D from the sunlight. The effects of living at high latitude, having a darker skin complexion or completely covering up the body with clothes found in some cultures can also limit sunlight exposure and vitamin D synthesis in the skin. It is especially important for women at risk to supplement their diet with vitamin D during pregnancy (15).

1.6.7 Thiamin and pregnancy outcomes

The UK dietary requirement for thiamin during pregnancy increases by 0.1mg/d for the last trimester (14) because of sequestration by the foetus and placenta (38). However because the increase is small and because of the variety of foods (whole grains, nuts, meat and fortified white and brown bread and breakfast cereals) consumed in the western diet containing thiamin, deficiency is rare. Thiamin has a role in releasing energy from carbohydrate (CHO) and therefore ideally thiamin intake should be directly related to CHO intake (39). Deficiencies are often found in globally poorer populations where a diet high in CHO such as polished white rice is consumed (40) and where thiamin intake cannot be proportionally matched. Decreased erythrocyte thiamin concentrations have been observed in pregnancies complicated by IUGR (41) as reported in Butterworth, 2001 (38).

1.6.8 Riboflavin and pregnancy outcomes

An increase of 0.3 mg/d of riboflavin (14), is recommended during pregnancy to meet the extra requirements for foetal tissue synthesis and CHO, energy and fat energy utilisation. (40). This increase is expected to be met by following a balanced varied diet. Riboflavin is found in milk, eggs, liver and green vegetables and in fortified breakfast cereals, all of which are highly available in the British diet. However, The National Diet and Nutrition Survey update for 2008/2009-2009/10, found that 17% of girls aged 11 to 18yrs and 11% of women aged 19 to 64 years in the UK had a riboflavin intake below the LRNI (22). These two age groups, both of which are of child bearing age, would be at an increased risk of riboflavin deficiency should they become pregnant due to their already inadequate intake and the increased requirement brought on by pregnancy. This could have an adverse effect on the developing foetus, and biochemical deficiency has been associated with a decreased birth length suggesting growth retardation in deficient subjects (42).

1.6.9 Iodine and pregnancy outcomes

Iodine is found in sea foods, milk and milk products, and dependant on the soil content is also found in varying amounts in vegetables and grains (43). The National Diet and Nutrition Survey update for 2008/2009-2009/10 (22), found that girls aged 11 to 18 years in the UK have an inadequate iodine intake, although clinical deficiency in the UK is rare. If a young women with an inadequate intake of iodine becomes pregnant, it would be wise for her to increase her milk and milk products intake to prevent iodine deficiency occurring. Milk is the main source of iodine in the UK diet and also provides other beneficial nutrients such as calcium during pregnancy while increasing sea foods in the diet could increase dietary mercury levels which have been shown to have teratogenic effects of the foetus. A consequence of iodine deficiency is hypothyroidism

and infants born to mothers who suffer either hypothyroidism or are iodine deficient can suffer from mental retardation, cretinism (40), low birth weight and premature birth (44), and incidences of foetal loss and stillbirths are increased (40). A recent review of iodine and brain development has suggested that a mild to moderate deficiency of iodine can potentially damage brain development during the first half of pregnancy (45). While iodine supplementation can help to prevent adverse pregnancy outcomes (40), fortification in the UK is not considered necessary on a population basis, due to the rare incidence of iodine deficiency.

1.6.10 Zinc and pregnancy outcomes

Zinc has roles in cell division, tissue growth, immune system functioning and is a component in the structure and function of the skin. It is therefore involved in the reproductive process, and foetal growth and development. A low zinc intake and status is associated with LBW and pre-term delivery (46). Zinc supplementation during pregnancy has been shown to increase gestational age and foetal growth (47), however routine supplementation in the UK is not required due to the low rates of zinc deficiency. The IOM recommends that zinc supplementation should be given when more than 30mg/d of iron is given to counteract the competitive absorption effects (40), however this is not practiced in the UK.

1.6.11 Selenium and pregnancy outcomes

No increase of selenium is recommended during pregnancy (14), however, in the UK selenium intakes have decreased with the decline in the use of American hard wheats (which are naturally higher in selenium), and the average intakes are thought to be below the recommended levels (43). The impact of this on foetal development has not been widely investigated and while infant cord serum has been shown to correlate to

birth weight (48) more randomised controlled trials need to be conducted to confirm this (49).

1.6.12 Vitamin B12 and pregnancy outcomes

Vitamin B12 deficiency during pregnancy is rare in the UK, but with the best dietary sources being shellfish, crab, fish, liver and beef, cheese and eggs, vegan or vegetarians who eat little dairy foods and eggs may be at an increased risk. A study conducted in South Indian women, where nearly 30% of infants born have a low birth weight, (including IUGR and premature infants) (50), found that vitamin B12 intake is associated with IUGR (51).

1.7 Supplement Use

Folic acid and vitamin D are the only dietary supplements advised during pregnancy by the British Dietetic Association (52). Other supplements are often prescribed during pregnancy when body nutrient status is low, the most common being iron supplementation. Nutrient deficiencies during pregnancy can contribute to higher incidence of low birth weight (40) and supplement use could help to address the situation. A study conducted by Zeng et al (53) found that multi micronutrients significantly increased birth weight compared to folic acid supplementation alone ($p = 0.019$) and that multi micronutrients and iron with folic acid supplementation significantly increased gestation time ($p = 0.004$ and $p = 0.001$) compared with folic acid alone. The iron with folic acid group decreased the risk of early pre-term delivery by 50% ($P = 0.031$) and increased the length of the baby at birth ($p = 0.03$) compared with folic acid supplementation alone. No effect on head circumference was detected. Taking multi micronutrients and the combination effect of folic acid and iron therefore appears to increase birth weight, length of the baby at birth and length of the gestation

above taking folic acid alone (53) suggesting that a balance of adequate micronutrients supports optimum growth and development of the foetus.

Based on the information discussed in this chapter it could be expected that there would be high rates of women supplementing their diet with vitamin D, iron and calcium during pregnancy and folic acid during the first trimester, to help provide optimum nutrition to their growing foetus, to top up nutrients where the average UK diet falls short and to help protect the mothers own body stored and health. Multi micronutrient supplementation may also be popular to ensure that no nutrient requirements fall below the expected during pregnancy and may serve to top up nutrients such as selenium and iodine where intakes in Britain have been deemed inadequate. While commenting on supplement use during pregnancy and assessing the importance of individual nutrient intakes for the health of the mother and her unborn child are important, so too is assessing and commenting on the diet as a whole, it is after all a complete diet of food items which supply the nutrients to the body.

1.8 Current diet of Asian populations in Britain

Consuming food provides the body with the nutrients required for growth, development, maintenance and repair and while food choice between population groups will differ, the nutritional content may or may not. In terms of food choice it would probably be assumed that a South Asian family living in Britain will be consuming different foods and meals to that of the Caucasian population. First generation UK South Asians are known to have a diet rich in pulses and vegetables (54) as cited in Bhakta et al (55) and a more recent study found that first generation South Asian women residing in the UK had a higher mean energy, CHO, iron, calcium and fibre intake and a lower protein, folate, vitamin D, B12 and zinc intake than the Caucasian women as measured by

24hour recalls and diet diaries (55). The lower folate, vitamin D, B12 and zinc intakes, as well as the altered bioavailability of iron and zinc caused by an iron/fibre absorption relationship may have effects on foetal growth and development and pregnancy outcomes if the nutrients are below recommended values. The evidence above shows that diets and nutrient intakes do differ between the diets of Caucasian and South Asian women living in the UK and the social and cultural reasons for this need to be explored.

1.9 Influences of food choice during pregnancy.

In more recent decades, there has been an increase in food choice and individuals have become much more aware of the health impact that such choices may have. However, awareness of food choices and associated health implications alone do not influence food choice. Food choice as an everyday continuous task, is a complex process and it involves factors both internal and external to each individual (56) such as individual tastes and upbringing (57) social and cultural norms and constraints (3, 57) and emotional (57), economic and physical abilities all playing a part.

1.9.1 Social and cultural determinants of food choice.

The social and cultural determinants of food choice are those factors which are so deeply embedded within the histories, beliefs and roles of ourselves and of those around us that their importance in the food choice decision making process goes past almost unnoticed. Some of the social and cultural determinants of the food choice decision will be discussed below.

1.9.1.1. Gender roles.

Gender plays a major part in influencing the choice of family meals, both by determining the role of who shops and prepares the meals and by the choice of food

prepared. In most cultures the women are generally responsible for the shopping and food preparation of the family meals, however whether this means that the choice of foods and meals in the household is based on the mothers choice remains undecided. There is research to suggest that the gatekeepers being those who purchase and prepare the meals have most of the control over the meal choices of the family (58). Other research has shown that food choice for family meals is often decided by the mother but based on the husbands or male partner's food preferences and that the mother will often put her preferences last below that of her partner and/or children (59, 60). While the research conducted by McIntosh (58), Murcott (59) and in the review article by Coveney (60) are not specifically referring to a South Asian population living in Britain, a study conducted by Centers et al (61) found that the husbands had the greatest power on general family decisions in couples of Asian descent suggesting that this may also be true of family meals. It should also be suggested that gender roles during pregnancy may change and while there is little evidence to document gender roles changing during pregnancy within South Asian households, this study will explore this within aim 2a.

1.9.1.2. **Religion**

Religion can inadvertently affect food choice not only by excluding some foods but by setting specific times of the day to eat and therefore adjusting the choice of food. For example recent research has identified that during Ramadan the consumption of proteins, carbohydrates and calorific intakes increases while fat intake decreases (62, 63) suggesting that different food items or different portions of certain foods are chosen. Religion does not only influence food choice by restricting foods, it also influences food choice by assigning certain roles and hierarchies to the household. Some research conducted in Israel on the interaction of family members and food choices in the home, has found that the male partners or husbands tended to consume more meals of their

own preference than the women and that this was true for all levels of religious observance from secular to ultra-orthodox (64). Interestingly Just (64) also found that family meals for the non-religious were less likely to be to the children's satisfaction than those children in a religious household (64). It should be highlighted however that this study was conducted in a Jewish population and the outcomes may not be the same for families of other religions, but neither should it be ruled out that religion may have an effect on the food choice decision making processes of a South Asian household in Britain.

1.9.1.3. Social support and kinship

Social support and kinship may play a part in food choice where effective support from family members and close friends can allow the gatekeepers time to purchase and prepare meals for the family. In Hindu and Jain South Asian culture in Britain it is still popular for nuclear families to live as part of an extended family unit or at least live within close proximity as it is thought beneficial as the household chores, childcare and family meals can be shared (65). While this extended family living may allow the gatekeepers more time to prepare family meals the meal choices are likely to be influenced by the preference of certain family members as previously described in paragraphs 1.9.1.1 and 1.9.1.2 and may offer less scope for individual food choice.

During pregnancy food choice may also be influenced by social support and kinship relationships. Gutierrez (66) in her Mexican American cohort reported the influence the in-laws and particularly the mother-in-law had on the pregnant woman. It was reported that the mother-in-law showed great willingness to take care of her daughter-in-law, ensuring she ate good foods, walked daily and rested and this advice was listened to and practiced by the pregnant woman (66). As South Asian women in the UK often live in

extended family units and that the Grandmothers both maternal and paternal often play a large role in the decision making process of infant feeding in the immediate post birth period (65), it could be suggested that similar influences may affect food choice during pregnancy and this influence will be explored in this study.

1.9.1.4. Tradition and beliefs

Tradition and beliefs play some part in food choice and often interlink with Religious and social gatherings where eating food is part of cultural and social activities (60). Religious festivals for example influence food choice with certain food being eaten on certain days or in the lead up to a festival. Some traditions and beliefs may also influence food choice on a more regular basis. Traditional beliefs in Mexico lead mothers to believe that if a food craving during pregnancy is not satisfied then the baby will be born with the same craving. This may bring about complications with pica or unhealthy food choices (66) as the mother tries to protect her baby from unhealthy cravings once the infant is born. Such traditional beliefs will be explored in South Asian women in this study in line with aim 2a.

1.9.2 Emotional

Unlike most social and cultural influences of food choice which are generally external to individual, emotion is very much a personal and internal influence of food choice. Often women describe having a heightened sense of emotion during pregnancy and therefore it is not surprising that Tuffery (67) reported that depression and anxiety in women recruited in the South West of England during the final trimester of pregnancy altered the foods consumed by the women. The women tended to either consume more of certain foods (chocolate was mention in particular) or they lost their appetite altogether. (67).

1.9.3 Physical

During pregnancy the role of eating food also extends to providing the correct nutrients for the growing foetus, and women are often conscious of what they are eating for the sake of the growth and development of the foetus, much more than they have been conscious of nutritional intake for themselves, pre-pregnancy or 6 months post-partum (67). However, food choice and the amount of food consumed during pregnancy is not always about what the women would like for herself and her unborn child, often the physical side effects of the pregnancy itself such as nausea, heartburn, tiredness and food cravings can have a great influence (67).

1.9.4 Economical

While this study is less concerned with the economical influences of food choice it should be briefly mentioned that personal finances will undoubtedly play a part in determining food choice.

Nutritional adequacies and inadequacies during pregnancy have in the past been shown to influence the health of an unborn child and that investigating the diet and the birth outcomes of populations with known adverse birth outcomes is essential in identifying and reducing risk. However, it is also important to explore the underpinning determinants of food choice to help explore and understand where and why nutritional inadequacies may be occurring.

1.10 Aims of the Study

The aims and objectives of this study were:

Aim 1. To assess the relationship between nutritional intakes from the diet and supplements with birth outcomes in Caucasian and South Asian women living in the UK.

Objectives

a. Collect typical nutritional intake data of South Asian women.
b. Evaluate the relationship between supplement use during pregnancy and birth outcomes.
c. Compare the use of supplements during pregnancy between Caucasian and South Asian women.

Aim 2. To explore the social and cultural determinates of food choice during pregnancy for South Asian women.

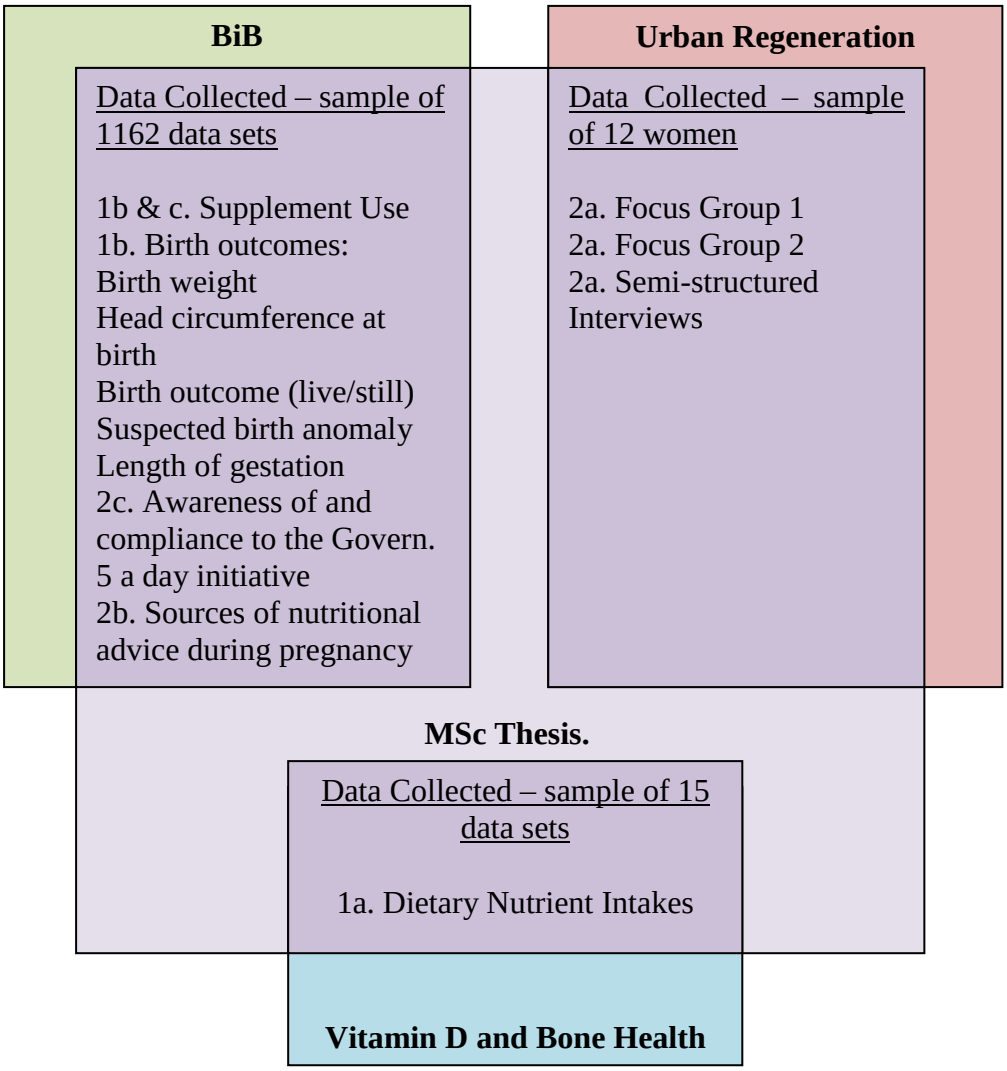
Objectives

a. Use focus groups and individual semi-structured interviews to explore the roles of the mother/wife/woman in South Asian households in the UK in the 21st Century and how their everyday life, religious and traditional beliefs and family members affects food choices during pregnancy.
b. Identify the main sources of nutritional information and advice for pregnant South Asian women.
c. Assess the awareness of the Government '5 a day' initiative and the impact this may have on the diet of pregnant South Asian's in the UK.

1.11 Map of the data collection

A map of the data collected within each collaborating project, and reported in this thesis is shown. The corresponding aim and objective (numbered as above) for each data set is given. (See fig. 1)

Fig 1. The study aims and objectives mapped onto the collaborative partners and data collected.



1.11.1 Collaborating projects and funding

This thesis and the research conducted within it have been undertaken in collaboration with three projects:

- The Urban Regeneration Project (UR) funded by Hefce

- The Born in Bradford Project (BiB) (6) funded by various research grants and charitable donations.
- A study investigating vitamin D intake and status with bone health in South Asian women, funded by the Lancashire Teaching Hospital NHS Trust Research Directorate Seedcorn funding.

The UR and the BiB projects collaborated to bid for funding to undertake the UR study described above. This allowed the BiB project and the UR study to receive funding to collect and report data of mutual interest as well as to have access to data collected separately within each of the projects.

1.11.2 The Urban Regeneration Project – Contribution of data

The UR project was set up to address the key challenges of urban regeneration in the northwest of England. One study within the UR project titled ‘’Health Inequalities in South Asian women: Nutrition and pregnancy outcome’’ was designed to explore the social and cultural beliefs surrounding food choices and parenting in South Asian women. Focus groups and individual semi-structured interviews were conducted to collect this data. Initially only 2 focus group sessions were planned by the UR project, but following the initial analysis of the focus group data, it was thought that conducting several individual semi structured interviews could provide some clarification and allow some deeper meanings of the identified themes from the initial analysis of the focus group data to be explored. The focus groups and the individual semi-structured interview analyses are included as part of this thesis. The focus groups and individual semi-structured interviews were jointly planned with Dr Nicola Lowe, Dr Sophie Smailes and Anna Skinner BSc. Anna facilitated the groups and interviews, transcribed the audio recordings and undertook the analysis.

1.11.3 The Born in Bradford Project – Contribution of data

The BiB project was longitudinally studying the causes of childhood illness in Bradford. Supplement used during pregnancy, birth outcome, birthweight, head circumference at birth and birth anomaly data reported in this thesis were collected as part of the BiB project. Awareness and adherence to the Government 5 a day initiative (5) and sources of nutritional advice during pregnancy were included into the BiB questionnaire as part of the collaboration with The UR Project. Over several months Anna helped the BiB recruitment team to recruit pregnant women and to administer the mothers baseline questionnaire to the women and also to help in the BiB project office. The results of these sets of data were analysed by Anna.

1.11.4 The Vitamin D and Bone Health Project – Contribution of data

In addition, a project funded by the Lancashire Teaching Hospital NHS Trust Research Directorate and Seedcorn funding was running parallel with the data collection for this study. The project was investigating vitamin D intake and status with bone health in South Asian women and involved collecting dietary intake data, and as dietary data from South Asian women was pertinent to this MSc project this data has been included. Anna met with the participants of this study, took anthropometric measurements, explained the diet diary to the participants and analysed the results.

The data collection methods will explained in detail in chapter 2.

CHAPTER 2

METHODS

2.1 Supplement use and birth outcome data.

To fulfil aim and objectives 1 b & c of this project (see paragraph 1.10), supplement use and birth outcome data were collected in collaboration with the BiB project (see Fig 1.) Supplement use data was collected within the Mothers Baseline Questionnaire (see 2.3.3 and Appendix 1, questions H3 & H3a) and details of the birth outcome measurements including birth outcome (live/still), birth weight, length of gestation, and any suspected birth anomalies were routinely recorded at BRI, and head circumference at birth was collected by trained BiB staff shortly after birth.

2.2 Awareness and compliance to the Government 5 a day initiative.

To meet study aim and objective 2c (see paragraph 1.10) this study collected data in collaboration with the BiB project (see Fig 1.) by adding questions to the Mothers Baseline Questionnaire (see 2.3.3). Questions about the awareness of and compliance to the Government ‘’5 a day’’ initiative were asked to determine if this message had reached the South Asian communities and to comment on whether this campaign had influenced food choice for the women. The added questions can be seen in appendix 1, question M4.

2.3 Sources of Nutritional advice during pregnancy

To meet study aim and objective 2b (see paragraph 1.10) this study collected data in collaboration with the BiB project (see Fig 1.) by adding a question to the Mothers Baseline Questionnaire (see 2.3.3). A question asking where the participants obtained their nutritional advice during pregnancy from was collected to help determine the

factors that influenced food choice for South Asian pregnant women. The added question can be seen in appendix 1, question M5.

2.3.1 Recruitment strategy at the Born in Bradford Project

Recruitment onto the BiB project primarily took place at the Glucose Tolerance Testing (GTT) clinic at the Bradford Royal Infirmary (BRI), however women were also recruited both on the ante and post natal wards at the BRI. The GTT appointment involved the women having a baseline blood test followed by a glucose drink which should be consumed with a 5 minute time frame of the initial blood tests. The blood tests are repeated 2 hours later to determine the blood glucose level. It was within this 2 hour time frame that the women were asked to participate in the BiB study. Once the women had completed their baseline blood test and glucose drink, they were asked to attend the BiB recruitment office. A screened off booth in a room set aside for the BiB project was used to recruit the women. The BiB study was explained to the women giving details of what the BiB project was trying to achieve, what was being asked of the women and the tests and information that would be held on both on them and their child. The women who agreed to take part were permitted to opt out of certain tests and procedures such as taking a sample of the cord blood. Based on this information and choices given to the women by the BiB recruitment staff, the women gave their informed and written consent to take part in the study by completing and signing a consent form. Those women who did want to take part completed the ‘’Mothers baseline’’ questionnaire in the BiB recruitment office and those who did not returned to the waiting room to complete their GTT appointment. Soft chairs and water were available to the pregnant women throughout the duration of the questionnaire to make the women as comfortable as possible. Lower soft chairs and foot stools were also available because occasionally the fasting women felt nauseous and faint. Toys were

also available for any children present in the recruitment office to keep them entertained while their mothers completed the baseline questionnaire.

2.3.2 Participants

All pregnant women of all ethnicities attending the GTT clinic between the dates of 1st October 2007 and 7th March 2008 were approached for recruitment. Most women although not exclusively were between 26-28 weeks gestation.

2.3.3 Mothers Baseline Questionnaire

The Mothers baseline questionnaire (see appendix 1) consisted of 42 pages of a structured, partly interview administered and partly self-completed questionnaire. The questionnaire was piloted and refined by The BiB project before any data was collected. The interviewer administered questionnaire consisted of 10 sections with mainly multiple choice tick box and one word answer questions on body measurements, demographics, ethnic background, education, employment, income, lifestyle and health questions concerning alcohol, drug and tobacco use and caffeine, water, bread and supplementation intakes. There were a further two sections with multiple choice tick box answers on psychological and emotional health, exercise and food intakes, which were self-completed by the study participants. The questions on the ‘’5 a day’’ campaign, adherence to consuming 5 portions in line with the campaign and sources of healthy eating advice added by this study to the BiB Mothers Baseline Questionnaire were collected within the self-completed section.

2.3.4 Analysis

Data from the mothers baseline questionnaire which was relevant to this project was manually extracted into the data analysis program SPSS version 18 (68). As much of the data was either nominal or ordinal ea ch of the answer options were given a code within SPSS version 18 (68). The interval scale data for length of gestation, head circumference at birth and birth weight were input into SPSS version 18 (68). To analyse birth weight, the data has been split into groups according to gestational age at birth, being pre-term (<37 weeks gestation), term (37-42 weeks gestation) and post-term (>42 weeks gestation), so that accurate comparisons can be made. A test to establish if the population groups for each of the gestation categories were initially run to establish if parametric or non-parametric test should be conducted. Birth weight data and head circumference data have been analysed using an independent samples t-test to detect any statistical difference between ethnic groups. The association of birth weight or head circumference and supplement use was analysed using an independent samples t-test for within ethnicity comparisons and an Analysis of variance (ANOVA) has been used to analyse supplement use and head circumference or birth weight data between the two ethnic groups.

Depending on the data being reported, results have been presented either as numbers of participants, % of total responders or as mean ± standard deviations (SD).

Demographic data, birth outcome (live/still), birth anomalies and supplement use data has been reported using numbers of responders and/or the total % of participants.

Awareness of and compliance to the Government 5 a day initiative and sources of nutritional advice are expressed at % of total responders.

In all statistical tests a value of $P<0.05$ was taken to be significant.

2.4 Dietary Intakes

It was not possible to collect detailed dietary intake data from the BiB women, therefore to achieve aim and objective 1a (see paragraph 1.10) dietary intake data was collected from South Asian women of child bearing age to assess their diet in terms of adequacy for the peri conceptual and 1st trimester periods. This data was collected in collaboration with the Vitamin D and Bone Health project (see Fig 1).

2.4.1 Recruitment

Recruitment took place at Bangor Street medical practice in Blackburn UK. At the appointment women were given information about the project and informed and written consent was obtained prior to commencing the data collection for the study.

2.4.2 Participants

All women between the ages of 19 and 35 who were born in the UK or had been in the UK since the age of 5 years, were not pregnant or breastfeeding and had not given birth within the previous 18 months and were in good health and not on any medications were identified from the patient lists and contacted to attend an appointment for recruitment to a project investigating vitamin D and bone health in South Asian pre-menopausal women.

2.4.3 Anthropometric Data

Height was measured with a wall mounted stadiometer (Seca) and weight was measured with light clothing and no shoes on a medical scale (Seca, Macclesfield, Cheshire, UK).

Waist:hip ratio was measured over light clothing with hip measurements taken from the widest part and the waist measurement taken at the naval.

2.4.4 Diet Diary

A completed 7 day diet diary (see appendix 2) was also required for the vitamin D study and it is this diet diary data that has been used for this project. The diet diaries were given to the women and the layout of the diary and instructions to record all items of food and drink consumed over 7 consecutive days were explained to the women. It was highlighted that whenever possible, food and drink consumed should be recorded at the time of consumption and that brand names and commercial weights on packets should be included where possible. The diary also included a portion picture guide of 20 food items and the research assistant explained that the picture portion guides could be used for similar foods (see appendix 2). Instructions were given to the women to either post the diet diary back to the University of Central Lancashire using the prepaid prepared envelope or to hand the diary into reception at the medical practice.

2.4.5 Analysis

The completed diet diaries were coded and entered into WinDiet (69) analysis package. To code the diet diaries each food and drink item was separately input into WinDiet (69) by closely matching the food or drink items in the diary to the food and drink items included in WinDiet (69) database. To ensure continuity throughout coding the diaries, where portion sizes were slightly ambiguous (for example ‘’a tea spoon’’ and ‘’a packet of’’) notes were made to ensure all similar descriptions were given a similar portion size. Once all of the diaries were coded the WinDiet (69) dietary intake analysis for each participant was entered into SPSS version 18 (68) and the statistical tests run.

Dietary intake has been reported as mean ± SD. CHO, protein and fat intakes have also been expressed at % of total energy and several micronutrient intakes have also been expressed as % of RNI.

In all statistical tests a value of $P<0.05$ was taken to be significant.

2.5 Focus groups 1 & 2 and Individual Semi-structured interviews

To achieve aim and objective 2a (see paragraph 1.10) and to support and add context and meaning to the quantitative data, two focus groups and seven individual semi-structured interviews were conducted. The focus groups and the semi-structured interviews were conducted as part of the collaboration with the Urban Regeneration project (see Fig 1). Focus groups were the chosen method for the initial data collection primarily because such group sessions are particularly good at capturing emergent data (70). The focus groups were held 1 week apart to keep the momentum of attendance and discussion. It was felt that a gap longer than this could lead to a loss of attendance. The focus groups were planned to be 1 hour long with the room booked for 1h 30mins in case the session ran over time. The sessions were planned to be held during the mid-morning to allow mothers to drop off and collect children to and from school. Following the analysis of the focus groups it was thought that semi-structured interviews at this stage would help to focus the participant to fewer subjects, explore more deeply emergent themes arising from the focus groups analysis and to explore the gaps in information. The idea at this stage was to delve deeper into the themes rather than to open up another broad subject area.

2.5.1 Focus Group 1: Session arrangement

An interpreter attended the session to allow one non-English speaker to take part in the session. The interpreter was a bilingual member of staff at the SureStart childrens' centre. Snacks and hot and cold drinks were provided by SureStart for the session. Soft low chairs were arranged in a group circle to allow and encourage group discussion and to allow everybody to see each other equally. During this session the toys were arranged in the centre of the circle so that the children could be close to their mothers. The first focus group was designed to focus on food, shopping and family roles. The plan can be viewed in chapter 5 figure 7.

2.5.2 Focus Group 2: Session arrangement

No interpreter was required to take part in this session. Snacks and hot and cold drinks were provided by SureStart for the session. Soft low chairs were arranged in a group circle to allow and encourage group discussion and to allow everybody to see each other equally. During this session the toys were arranged at the perimeter of the circle during this session to try to limit the amount of noise crossing the circle during the session. A staff member of SureStart was present in the room to play with the children. If the child then wanted their mother, the child was brought to her. The second focus group was designed to focus on pregnancy and parenting. The plan can be viewed in chapter 5 figure 10.

2.5.3 Individual Semi-Structured Interviews: Session arrangement

The semi-structured interviews were also held at the SureStart Centre in Bradford in a smaller room with an office type table and chairs. The facilitator sat one side of the table facing the participant on the other side. Several questions were designed for the semi-structured interviews informed by the emergent themes arising from the two focus

groups. A plan of these questions can be seen in chapter 6. The questions were asked in no particular order, rather slotted in at an appropriate time relevant to the stories of the participants. This allowed for flexibility of stories to be explored but served as a prompt for the interview to remain relatively focused.

2.5.4 Recruitment Strategy

South Asian mothers in the UK were accessed through a SureStart Childrens' Centre in Barkerend Bradford. Staff at the SureStart Childrens' Centre approached women in the centre to see if they would like to take part in the study. The staff were given an information form to hand out and any women interested in taking part in the study were asked to attend a session where further details would be given. The staff also contacted mothers in their area by phone call to see if they would be interested in attending the group. The aim was to recruit 12 women to allow for non-attendance on the day of the sessions. The day before the sessions a staff member at SureStart called the women who had agreed to attend again to remind them of the session. At each of the focus group and individual semi-structured interview sessions the aims of the study were discussed with the women and if they wanted to take part written and informed consent was collected. It was also carefully explained to the women that the session would be audio recorded and consent was also gained to do this. Once consent was obtained the women were asked to complete a short questionnaire to gather details about place of birth, residence in UK and language, primarily so that the facilitator could be aware of any language needs during the session but also so that themes arising from the sessions could be assessed against place of birth.

2.5.5 Participants

All of the women in the focus groups and individual semi-structured interviews were either born in South Asia or had ancestral history and were now resident in Bradford UK. Women who were British born were also included in the study and all participants had given birth within the previous 24 months. The original aim was to recruit women who had given birth in the previous 12 months so that the women were discussing events which were relatively recent to them, however the staff at the SureStart Centre had trouble recruiting enough women with this criteria and so the 24 month cut off was implemented. Pre-school children of the mothers also attended the session and toys were available for the children to play with. The numbers and demographics of the women attending each session will be reported in the results (see chapter 5 figures 8 and 11 and chapter 6 figure 14).

2.5.6 Facilitation of the sessions

The same facilitator was used for both of the focus groups and all of the individual semi-structured interviews. The facilitator was previously unknown to all the participants, was not from the area and was of British Caucasian ethnicity. Before both of the focus group sessions commenced the facilitator reminded everybody that the session was confidential and that any information heard during the session should not be repeated outside of the private room in the Centre and should not be repeated even to family members.

2.5.7 Analysis

The focus groups and individual semi-structured interviews were transcribed verbatim. A professional transcriber was employed to transcribe the focus groups, however the transcription was not complete and the transcriber admitted that she could not hear a lot

of what was said above the noise of the children. The facilitator was able to complete more of the transcription because she was present at the session and was more aware of the discussions held. It was then decided that the facilitator would transcribe the individual semi-structured interviews. Where sections of the focus groups audio recordings were spoken in a language other than English, a member of the BiB team translated what had been discussed and notes were made by the researcher, this was done to check what the translator had stated during the focus group sessions. The transcripts were thematically analysed following Attride-Stirling's process of analysis (71). This study was trying to explore the social and cultural influences on food choice and therefore a constructionist method of thematic analysis which examines the meanings, experiences, and realities within a society was chosen (72). The transcriptions from both the 2 focus groups and the individual semi-structured interviews were read by 3 researches and discussed. The data from the focus groups and the individual semi-structured interviews were analysed separately using the same methods. Both the focus groups and the individual semi-structured interviews were designed to allow the women to discuss their experiences surrounding food choice, however extracting the underlying ideas, assumptions and conceptualizations embedded with the socio-cultural group was the aim of the study and therefore the data were analysed using a latent approach, allowing the data to be analysed beyond the surface meanings (72). The first step in the analysis was to reduce the data using a coding framework based on recurrent issues highlighted during discussions (71). This initial step took on an inductive approach where no preconceptions influenced the coding of the data, allowing the data to evolve to begin the process of highlighting underlying issues (72). From the coded segments, salient common themes were extracted and refined. The basic themes were grouped according to subject, arranged and organised around an organising theme. The summary, main claims, arguments and assertions of

the organising themes provided the global theme. Using this framework the transcripts were revisited and read sequentially in line with the global, organising and basic themes. The global theme is discussed drawing in the organising themes and commonalities surrounding the organising themes were reported drawing in the basic themes which were used as an aid to construct the arguments and issues surrounding the research question (71).

2.6 Confidentially

Confidentiality of the data collected was maintained by all of the collaborating projects (The BiB project, The Urban Regeneration project and the Vitamin D and Bone Health project) by issuing each participant with a study ID number. This personal ID number labelled all data held for each individual and the data was kept separate from any records linking participant names to ID numbers. The records linking the study ID numbers to the participant names were securely locked away from any data.

To help prevent participants in the focus groups and individual semi-structured interviews being identified, all quotes used in this thesis have been labelled using a pseudonym which was allocated to each participant.

2.7 Ethics

Ethical approval has been granted by the NHS LREC for the BiB and Vitamin D and Bone health projects, and from Bradford University for the BiB project. Ethical approval has been granted by the University of Central Lancashire Ethical Approval Board for the Vitamin D and Bone Health project, The Urban Regeneration project and this study.

CHAPTER 3

SUPPLEMENT USE, DIETARY ADVICE AND THE INFLUENCE ON BIRTH OUTCOMES: QUANTITATIVE RESULTS

3.1 Overview of the chapter

All of the data analysed and reported in this chapter were collected in collaboration with the BiB project (see Fig 1). The numbers of data sets completed and analysed are reported first in this chapter, followed by the demographic data for the recruited women. In line with aim and objectives 1b and c (see paragraph 1.10) birth outcome, birth anomalies and the association between supplement use and birth weight and head circumference data, both between the South Asian and Caucasian women and within each ethnic group are explored and reported. This chapter will finish by reporting the results from the awareness and compliance to the 5 a day Government initiative (5) and sources of nutritional advice questions asked within the BiB projects Mothers baseline questionnaire, in line with aims 2b and c (see paragraph 1.10).

3.2 BiB Mothers Baseline Questionnaire Data Sets

One thousand three hundred and twenty eight sets of BiB data were collected from women attending the GTT clinic. Eighty six sets of data were excluded from our analysis for the following reasons: 19 women had declined their consent, 41 sets of data were determined as ‘out of area’ births and therefore no birth data was available for analysis, 25 sets of data were duplicated (included 19 sets of twin birth data) and 1 set of birth outcome data could not be matched to the mothers baseline questionnaire data

collected. One thousand two hundred and forty two sets of data were available for the analysis, however not all questions were completed by every participant.

3.3 Demographic Data

Table 1 shows the ethnic groups to which the participants responded with 41% of the women describing themselves as White and 52% as Asian or Asian British herein described as Caucasian and South Asian within the result section. This study will only report on 1162 data sets collected from the Caucasian and South Asian groups and where appropriate the term total cohort may be used to describe this set of data.

Table 1: Ethnic groups of the survey sample

Ethnic Group of survey sample	n	%
White	**511**	**41**
Mixed Ethnic	21	2
Black or Black British	30	2
Asian or Asian British	**651**	**52**
Chinese	2	0
Other	21	2
Uncompleted	6	0
Total	**1242**	**100**

3.4 Supplement Use

Of the 1162 Caucasian and South Asian responders, 3 women responded that they did not know if they used supplements during pregnancy, 448 women reported dietary supplement use during the previous 4 weeks of pregnancy, while 711 reported no use. The numbers of women reporting supplement use within their ethnic groups are shown in table 2.

Table 2: Supplement use in Caucasian and South Asian women during pregnancy.

	Non supplement users n	Supplement Users n
Caucasian	352	158
South Asian	359	290

Fig 2 shows the response distribution between the Caucasian and South Asian groups. Fifty five percent of South Asian women and 69% of Caucasian women did not take any dietary supplements. A chi-square test revealed a statistically significant (P<0.001) association between ethnicity and supplement use, with 45% of South Asian women taking dietary supplements compared to 31% of Caucasian women.

Fig 2. Comparison of nutritional supplement use between Caucasian and South Asian participants at 26-28 weeks gestation.

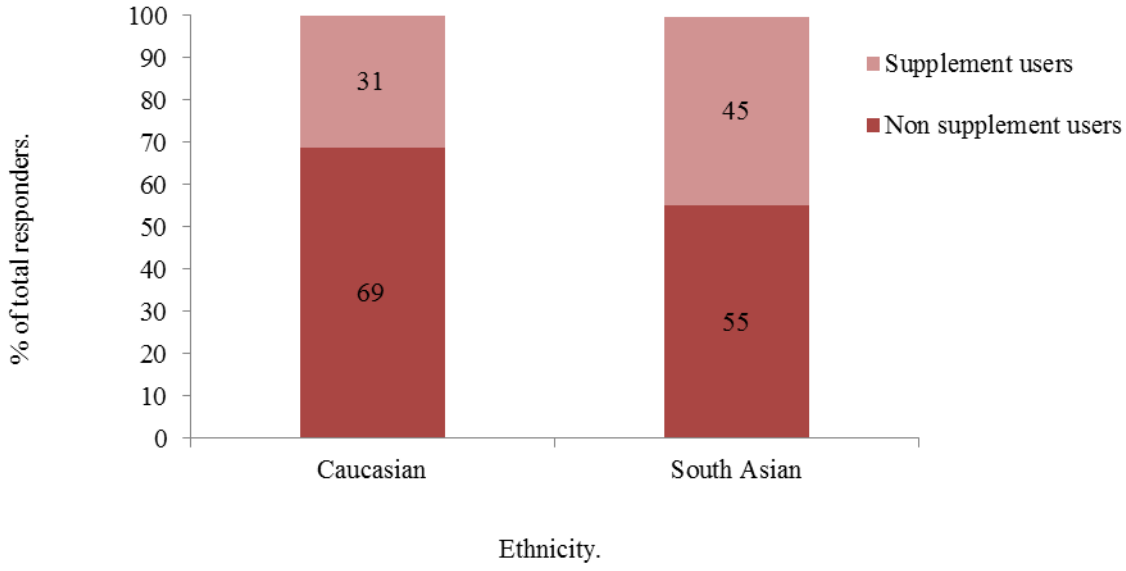
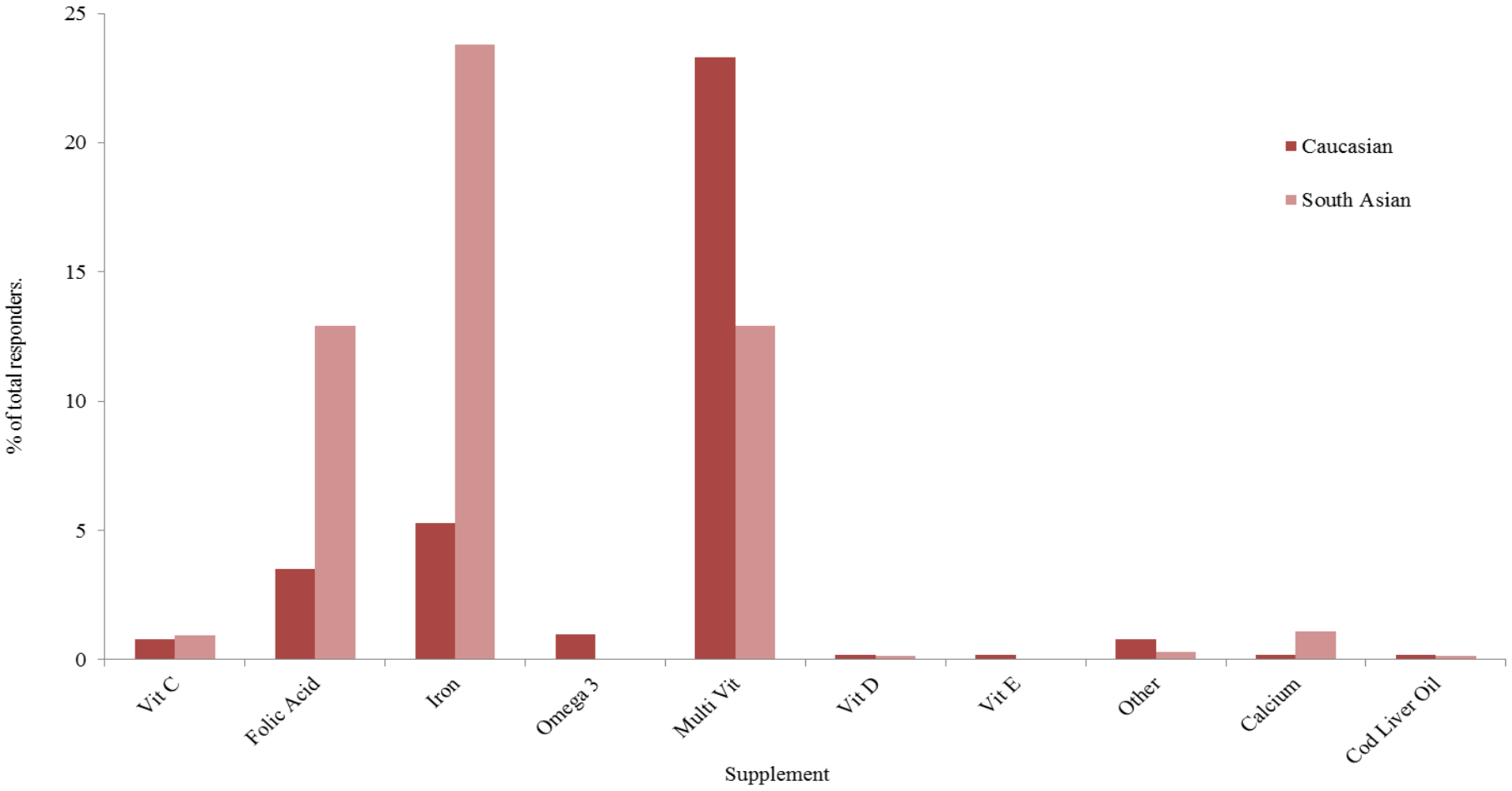


Fig 3 shows the distribution of dietary supplements used. Multivitamins were overall the most popular choice of dietary supplement followed by iron and folic acid. Iron and folic acid use were significantly (P<0.001) more frequently used in the South Asian group compared to the Caucasian group with 24% and 5% taking iron and 13% and 4%

taking folic acid respectively. Multivitamins however were taken by significantly ($P<0.001$) more Caucasian (23%) than South Asian women (13%). For all other dietary supplements the numbers of responders were too low to draw any statistically significant conclusions.

Fig 3. Supplement use by Caucasian and South Asian participants at 26-28 weeks of gestation.



3.5 Birth Outcome Data

3.5.1 Live and still birth data

Of the 1162 Caucasian and South Asian sets of data collected, 1137 were reported as live births, 2 were regrettably recorded as still births, both of which being to South Asian mothers and 23 sets of birth outcome were not recorded. One thousand one hundred and thirty three sets of birth weight data were analysed within the Caucasian and South Asian ethnic groups.

3.5.2 Birth Anomalies

Infants born to both Caucasian and South Asian mothers were screened for anomalies post birth. One thousand and thirty two records were available and 6 birth anomalies were recorded. All birth anomalies occurred in South Asian infants. Anomalies included suspected choroid plexus cyst, microcephaly, talipes and renal cyst and oligohydramnios.

3.5.3 Birth Weight

Table 3 shows the mean ± SD of birth weights stratified by pre-term (<37 weeks), term (37-42 weeks) and post-term (>42 weeks) gestation. An independent samples *t*-test yielded a significant ($P = 0.022$) difference between pre-term birth weights in South Asian compared to Caucasian women with birth weight being lower for the South Asian group, while post-term birth weights were not significantly different. An independent samples *t*-test yielded a significant ($P<0.001$) difference between the term birth weights for Caucasian and South Asian infants, with Caucasian infants being on average 238g heavier than South Asian infants.

Table 3. Birth weight stratified by length of gestation (g).[1]

	South Asian	Caucasian	Significance
Pre term	(37) 1973.24 ± 754.68	(30) 2369.33 ± 588.27	P = 0.022
Term	(596) 3180.47 ± 446.39	(465) 3418.47 ± 487.32	P <0.001
Post term	(2) 2810.00 ± 42.43	(3) 3780.00 ± 586.17	P = 0.113

[1]Independent Samples *t* test

3.5.4 Supplement use and birth weight data

Table 4, shows the birth weights of infants born to supplement users and non-users, grouped accordingly to ethnicity and stratified by length of gestation. When term and pre-term birth weights were analysed with supplement use in South Asian and Caucasian women, ANOVA yielded no significant difference between Caucasian and South Asian birth weights for mothers who did and did not use iron, folic acid or multivitamins during pregnancy. No statistical difference could be calculated for the post-term birth because the numbers of births in this group was too low.

When supplement use was compared within each ethnic group, iron supplementation during pregnancy was found to be significantly (P = 0.047) associated with an increased term birth weight for South Asian infants and multivitamin use during pregnancy was significantly (P = 0.028) associated with an increased pre-term birth weight in Caucasian infants only. No other association between iron, folic acid or multivitamin use during pregnancy, and birth weight over the 3 different gestation lengths within ethnic groups could be determined.

3.5.5 Head Circumference

Pre-term and term head circumference was significantly ($P = 0.045$, $P < 0.001$ respectively) larger in Caucasian than South Asian infants.

3.5.6 Supplement use and head circumference data

Pre-term, term and post-term head circumference was analysed within each ethnic group with those mothers who did and did not take dietary supplements during pregnancy. The mean head circumferences between those mothers who did and did not take supplements were no different for iron, folic acid or multivitamin use in the South Asian group or the Caucasian group (table 5). Similarly no significant difference in head circumference was found between Caucasian and South Asian mothers who did and did not take either iron, folic acid or multivitamin supplements during pregnancy (table 5).

Table 4: Birth weight of infants born to supplement & non-supplement users, grouped by ethnicity and stratified by length of gestation.[1]

	South Asian infant birth weight (n) g		P[2]	Caucasian infant birth weight (n) g		P[2]	P[3]
	Iron	No Iron		Iron	No Iron		
Pre term	(9) 1958.89 ± 974.38	(28) 1977.86 ± 691.37	0.949	(4) 1845.00 ± 813.45	(26) 2450.00 ± 520.84	0.23	0.20
Term	(139) 3244.45 ± 463.84	(455) 3160.71 ± 440.50	†0.047	(18) 3520.22 ± 626.39	(446) 3413.96 ± 481.79	†0.83	0.85
Post term	(0)	(2) 2810.00 ± 42.43	Not valid	(0)	(3) 3780.00 ± 586.17	Not valid	Not valid
	Folic Acid	No Folic Acid		Folic Acid	No Folic Acid		
Pre term	(1) 1840.00	(36) 1976.94 ± 765.05	0.861	(4) 2135.00	(26) 2405.38 ± 579.86	0.40	0.87
Term	(75) 3148.81 ± 439.90	(519) 3184.85 ± 448.35	†0.547	(11) 3510.91 ± 437.78	(453) 3415.83 ± 489.14	†0.53	0.39
Post term	(0)	(2) 2810.00 ± 42.43	Not valid	(0)	(3) 3780.00	Not valid	Not valid
	Multi Vitamins	No Multi Vitamins		Multi Vitamins	No Multi Vitamins		
Pre term	(3) 2450.00 ± 448.44	(34) 1931.18 ± 765.93	0.259	(6) 2833.33 ± 344.02	(24) 2253.33 ± 583.44	0.03	0.90
Term	(77) 3220.65 ± 398.64	(517) 3174.29 ± 453.91	†0.309	(111) 3471.41 ± 504.14	(353) 3401.31 ± 482.02	†0.17	0.75
Post term	(1) 2840.00	(1) 2780.00	Not valid	(1) 3580	(2) 3880.00 ± 791.96	Not valid	Not valid

[1] Mean ± SD (all values)

[2] Independent samples test within ethnicity between those who did and did not take supplementation.

[2†] Mann Whitney test within ethnicity between those who did and did not take supplementation.

[3] ANOVA. Difference in birth weights between ethnic groups with those who did and did not use supplements.

Table 5: Head circumference at birth of infants born to supplement & non-supplement users, grouped by ethnicity and stratified by length of gestation.[1]

	South Asian head circumference at birth (n) cm		P2	Caucasian head circumference at birth (n) cm		P2	P3
	Iron	No Iron		Iron	No Iron		
Pre term	(6) 30.12 ± 4.33	(21) 30.29 ± 2.51	0.90	(3) 29.90 ± 2.82	(23) 31.91 ± 1.90	0.11	0.35
Term	(130) 34.10 ± 1.38	(419) 33.96 ± 1.62	†0.39	(18) 34.41 ± 1.73	(415) 34.43 ± 1.69	†0.75	0.71
Post term	(0)	(2) 34.55 ± 1.48	Not valid	(0)	(3) 35.30 ± 2.52	Not valid	Not valid
	Folic Acid	No Folic Acid		Folic Acid	No Folic Acid		
Pre term	(1) 31.10	(26) 30.21 ± 2.96	0.77	(4)30.82 ± 2.68	(22) 31.83 ± 1.96	0.38	0.53
Term	(72) 33.93 ± 1.37	(477) 34.00 ± 1.59	†0.61	(11) 34.33 ± 2.02	(422) 34.43 ± 1.68	†0.90	0.96
Post term	(0)	(2) 34.55 ± 1.48	Not valid	(0)	(3) 35.30 ± 2.52	Not valid	Not valid
	Multi Vitamins	No Multi Vitamins		Multi Vitamins	No Multi Vitamins		
Pre term	(3) 31.30 ± 1.76	(24) 30.12 ± 3.02	0.52	(6) 32.92 ± 1.05	(20) 31.30 ± 2.16	0.09	0.83
Term	(72) 33.96 ± 1.67	(477) 33.10 ± 1.55	†0.72	(103) 34.41 ± 1.58	(330) 34.44 ± 1.72	†0.70	0.97
Post term	(1) 33.50	(1) 35.60	Not valid	(1) 34.90	(2) 35.50 ± 3.53	0.91	0.86

[1] Mean±SD (all values)

[2] Independent samples test within ethnicity between those who did and did not take supplementation.

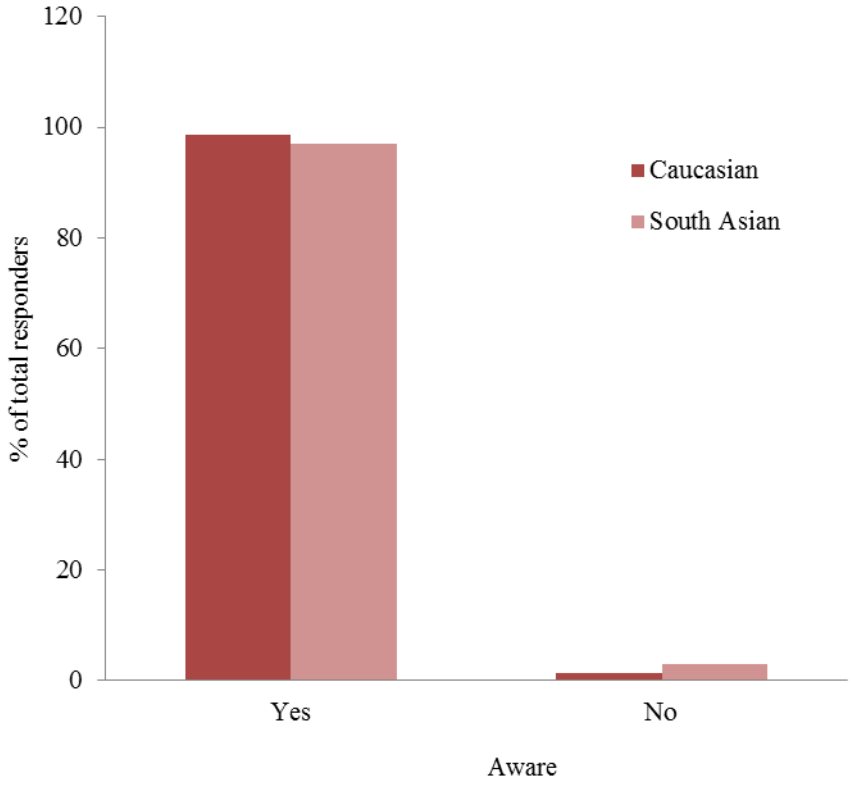
[2†] Mann Whitney test within ethnicity between those who did and did not take supplementation.

[3] ANOVA. Difference in head circumferences at birth between ethnic groups with those who did and did not use supplements.

3.6 Awareness of and compliance to the 5 a day Government initiative

The women were asked if they were familiar with the Government 5 a day (5) recommendation for fruit and vegetable intake. No difference between the Caucasian and South Asian women was indicated. Fig 4 shows that 99% and 97% respectively reported to being familiar.

Fig 4. Awareness of the Government 5 a day initiative.

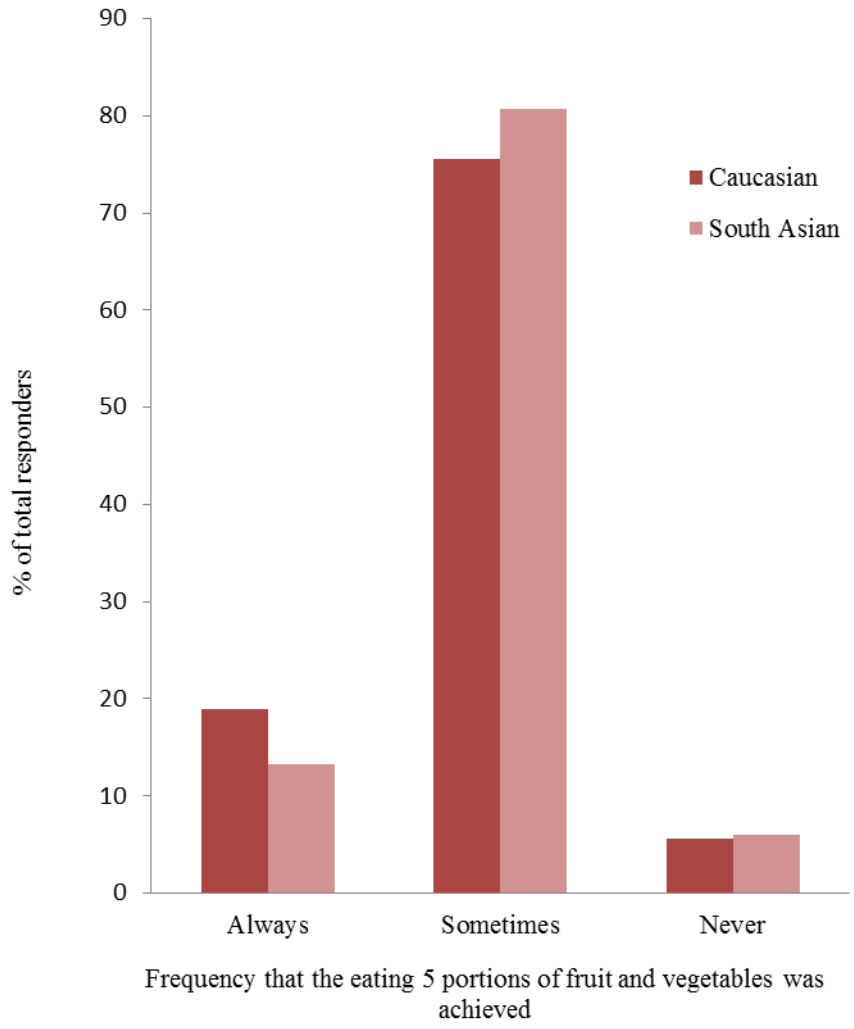


Of the interviews conducted in a language other than in English, only 8.75% responded to this self-completed section of the questionnaire. However of this small response 20 out of the 21 respondents were familiar with the 5 a day recommendation.

The women were asked to indicate how often they complied with the 5 a day recommendation answering if they always, sometimes or never ate 5 portions. Figure 5 shows that the Caucasian and South Asian group were very similar with 19% and 14%

respectively reporting always, 75% and 80% reporting sometimes and 6% and 7% of the women reporting never eating 5 portions during one day.

Fig 5. Compliance to the Government 5 a day fruit and vegetable recommendation.



3.7 Sources of Nutritional Advice during pregnancy

The women at the recruitment office were asked to indicate where most of their nutritional advice during pregnancy came from. The women were instructed to make only one choice from the following categories of family members, friends, magazines and newspapers, books, GPs or doctors, midwives or health visitors or other. The top choice by the total cohort in descending order is Midwives or health visitors, family

members, magazines or newspapers, books, other, GP or doctors and finally friends. Some of the women indicated that they used the internet (represented under other) as well as common sense. This data was analysed by ethnicity (Fig 6).

Fig 6. Sources of nutritional advice during pregnancy.

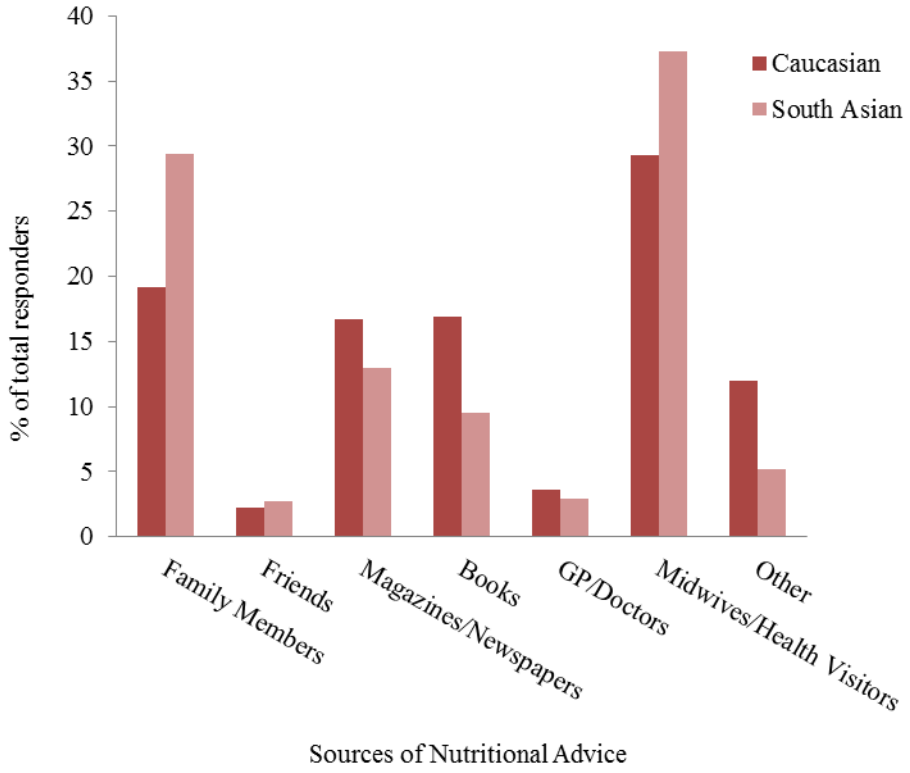


Figure 6 shows a similar pattern between the two ethnic groups. For the Caucasian group 29% chose midwives and health visitors and 19% chose family members as their primary source of nutritional advice during pregnancy. For the South Asian group 37% chose midwives and health visitors while 29% chose family members as their main source of nutritional advice. These top two categories represented 48% and 66% of the Caucasian and South Asian group's indication respectively. There was little difference between numbers opting for the friends and GP or doctors categories and only a small difference within the magazines and newspapers category. However books were more popular with the Caucasian group with 17% choosing this compared to 10% from the

South Asian group and other was more popular with the Caucasian group with 12% indicating this which was more than double than that of South Asian women (5%).

3.8 Summary

In summary, the analysis of the birth outcome data shows that the Caucasian infants born in Bradford are significantly heavier at birth and have a larger head circumference than that of infants born to mothers of South Asian origin and this finding is concurrent with other findings (1). This study also found that the three most commonly used supplements during the period of 22-28 weeks of gestation were multivitamin, iron and folate, and this finding has also been observed by Watson et al (2), investigating nutrient intakes in pregnant New Zealand women and birth weight. Supplement use was significantly higher in South Asian women during pregnancy, and South Asian women used iron and folic acid supplements more than Caucasian women, while Caucasian women were more likely to use multivitamin/minerals. Once all other confounders had been adjusted for Watson et al (2) found that only iron supplementation and not multivitamin/mineral or folic acid supplementation had any significant association with birth weight (+119g P=0.006). Although the findings were not significant and not adjusted for confounders, iron supplemented South Asian women had infants with a significantly (P=0.047) higher term birth weight (mean: +83.74g) compared to non-iron supplemented South Asian women. The association between iron supplementation and birth weight was highly insignificant for the other gestational periods for South Asian and Caucasian women, both within and between ethnicities. No association could be found for the use of any nutritional supplement during pregnancy and head circumference.

Encouragingly 98% of the total cohort reported that they were aware of the Government 5 a day initiative and 95% of those who conducted their baseline interview in another language other than English also reported being aware of the initiative, indicating that the initiative message has reached into many different ethnic and social groups in Bradford. It is also encouraging to report that only 6% of the total cohort reported never consuming 5 portions for fruit and vegetable in one day, 16% reporting that they always did and the majority (77%) of the cohort reporting that they sometimes consumed 5 portions of fruit and vegetable in 1 day suggesting that the initiative is a success and may be influencing the diets of the women in this study. This study has also found that imparting important nutritional messages to pregnant women through their Midwives and healthy visitors is beneficial as they were the most popular source of nutrition advice for both Caucasian and South Asian women in this study.

While this data can add understanding to the use of nutritional supplements during pregnancy and can indicate if such practices may have some association with birth outcomes, it does not give an understanding of the whole diet. The next chapter will discuss the dietary adequacies of South Asian women living in the North of England.

CHAPTER 4

DIETARY NUTRIENT INTAKES OF SOUTH ASIAN WOMEN: QUANTITATIVE RESULTS

4.1 Overview of the chapter

All of the data analysed and reported in this chapter were collected in collaboration with the Vitamin D and Bone Health project (see Fig 1). The numbers of data sets completed and analysed will be reported first in this chapter, followed by the demographic data for the recruited women. In line with aim and objective 1a (see paragraph 1.10) reference nutrient intakes in South Asian women of child bearing age will be explored and reported. Where possible the mean ± SD of each macro and micronutrient will be reported. The % of energy met by each macronutrient and the RNI and % RNI met by each micronutrient will be explored. The results will be analysed against the mean national averages reported for women aged between 19-64yrs in the UK as published in the NDNS update 2008/2009-2009/10 Dietary Reference Values for Food Energy and Nutrients for the United Kingdom and from the NDNS Vitamin and Mineral intake and urinary analytes published in 2003. (22,73).

4.2 Data Sets

Thirty six women were recruited and 17 diet diaries were returned. Of these, 2 diaries could not be used for the analysis because 1 had only 4 out of 7 days completed and the other had been completed over a period of illness and a holiday and therefore not representing a true and usual diet. Fifteen sets of diet diaries and anthropometric data were analysed.

4.3 Demographic Data

All of the women were British born and Muslim. The mean age of the women were 27.60 ± 5.15yrs, weight was 57.30 ± 11.81kg, BMI was 22.64 ± 4.27kg/m^2 and waist hip ratio (WHR) was 0.82 ± 0.64Gw/Gh. The mean BMI and WHR were within the healthy ranges of >18.5- ≤25 kg/m^2 and <0.85Gw/Gh respectively (74).

4.4 Energy Analysis

Table 6 shows the macro nutrients intakes for the South Asian women. The mean daily energy intake was 1640.80 ± 372.70kcal which was comparable to that reported in the NDNS which reported a mean UK national average of 1638.00 ± 477kcal from data collected in 2008/2009-2009/10 (22). Total fat and CHO intakes accounts for 34% and 52% of the total energy intake respectively, which is consistent with current recommendations (75, 76) and in line with the mean UK national averages reported in the NDNS (22). Protein accounts for 14% of the total energy intake which is consistent with the current recommendations, however when intake of protein was calculated at 0.75g per kg of body weight (77), protein energy intake was 17.70g higher than the recommendation of 42.9g/d. The non-starch-polysaccharide (NSP) intake of 9.69g per day for this group of women of child bearing age fell below the recommendation of 18g/d and is lower than that reported in the NDNS (22).

Table 6 Macronutrient intakes of 15 South Asian women aged 19-35 yrs.

	NDNS	% of total energy	Mean±SD
Energy (kcal)	1638.00 ± 477.00	100	1640.80 ± 372.70
Total Fat (g)	61.00 ± 24.00	34	63.80 ± 18.40
Protein (g)	65.40 ± 18.10	14	60.60 ± 14.90
CHO (g)	200.00 ± 63.00	52	220.10 ± 54.20
NSP (g)	12.80 ± 4.50		9.69 ± 3.30

4.5 Micronutrient Analysis

Table 7 shows the mean intakes of micronutrients for the South Asian women and the RNI, the % of the RNI met by the diet and the results from the national mean average intakes reported in the NDNS update 2008/2009-2009/10 (22).

Table 7 Micronutrient intakes of 15 South Asian women aged 19-35 yrs.

	NDNS	Mean ± SD	RNI	% of RNI
Vitamin A µg	547.00 ± 915.00	598.80 ± 325.97	600	100
Thiamin mg	1.97 ± 4.45	1.23 ± 0.35	0.8	153
Riboflavin mg	1.95 ± 4.27	1.30 ± 0.58	1.1	118
Nicotinic Acid mg	34.80 ± 14.10	27.41 ± 8.09	13	211
Vitamin B6 mg	2.80 ± 5.20	1.60 ± 0.41	1.2	133
Vitamin B12 mg	5.30 ± 6.40	2.60 ± 1.43	1.5	174
Folate µg	264.00 ± 134.00	208.47 ± 94.54	200	104
Pantothenic Acid mg	4.90 ± 1.71*	3.55 ± 0.88		
Biotin µg	26.00 ± 8.80*	21.59 ± 6.33		
Vitamin C mg	122.10 ± 149.90	144.77 ± 111.16	40	362
Vitamin D µg	3.70 ± 3.10	1.37 ± 1.14		
Vitamin E mg	8.60 ± 4.70	7.44 ± 3.76		
Calcium mg	767.00 ± 289.00	663.47 ± 207.99	700	95
Magnesium mg	237.00 ± 82.00	249.07 ± 74.62	270	92
Sodium mg	2029.00	2452.40 ± 1242.29	1600	153
Potassium mg	2560.00 ± 738.00	2771.33 ± 800.56	3500	79
Chlorine mg	3478.00 ± 984.60*	3715.33 ± 1959.87		
Phorphorus mg	1041.00 ± 275.60*	981.47 ± 266.19	550	178
Iron mg	11.80 ± 10.50	10.13 ± 3.77	14.8	68
Zinc mg	9.00 ± 5.70	7.57 ± 1.85	7	108
Copper mg	1.13 ± 0.61	1.08 ± 0.32	1.2	90
Manganese mg	2.45 ± 0.98*	3.20 ± 1.31		
Selenium µg	46.00 ± 24.00	35.73 ± 12.74	60	58
Iodine µg	153.00 ± 76.00	113.00 ± 43.00	140	81

*Figures taken from the NDNS 2003 report (73)

4.5.1 Vitamin A

Vitamin A intakes met 100% of the RNI and were slightly above the UK national mean average (22). This amount of vitamin A intake is appropriate to meet the requirements for a woman and her foetus during pre and peri-conceptual phases of pregnancy. While an adequate vitamin A intake is important for the development of the foetus, large

intakes from supplementation or vitamin A rich foods should be avoided to decrease the risk of any teratogenic defects in the developing foetus (27).

4.5.2 B Vitamins

All of the B vitamins were slightly below the UK national average (22) but were in excess of the RNI with nicotinic acid, vitamin B12 and thiamin being well above the RNI. The intake of thiamin was also sufficient to meet the RNI during pregnancy and riboflavin fell short by only 0.1mg/d. Folate, an important nutrient during the peri-concenptual period, met the requirements for a healthy adult women, however the requirement during the peri-conceptual period is 700µg/d (23). It is recommended that women wishing to become pregnant before and during the peri-conceptual phase up until the 12 week of pregnancy should consume a 400µg/d supplement, and their dietary intake should increase to 300µg/d (23). The women in this study would not currently meet the RNI for folate should they become pregnant without dietary intervention and an additional supplement.

4.5.3 Iron

Iron intake, was slightly below the UK national mean average (22) and was very low, meeting only 68% of the RNI. This finding would suggest that if these women were to become pregnant they would probably enter pregnancy being iron deficient. Low bodily iron stores can lead to IDA and IDA during the 1st trimester has been associated with LBW (26).

4.5.4 Vitamin C

The average vitamin C intake of 144.7mg/d was well above the RNI of 40mg/d achieving the RNI at 362% and above the UK national mean average (22). This intake

would also meet the increased intake of 50mg/d required during pregnancy. A low vitamin C levels has been associated with premature rupture of the membrane sometimes causing premature delivery (12).

4.5.5 Vitamin D

No RNI exists for the general population because 95% of the vitamin D in the body is synthesised in the skin from direct sunlight during the summer months in the UK and not from the diet (33). An RNI exists during pregnancy of 10µg/d. This analysis shows a dietary intake below the UK national average (22) (which may in part be explained by none of the South Asian women supplementing their diet with vitamin D) and well below 10µg/d. An inadequate supply of vitamin D in utero may be associated with adverse pregnancy outcomes, such as miscarriage, preeclampsia and premature birth (34) and because South Asian women in the UK have darker skins and live above a latitude of 42 degrees it would therefore be advised that if these women found out they were pregnant, they should increase their dietary intake of vitamin D. The BNF suggests both eating vitamin D rich foods such as oily fish and eggs, being careful not to consume too much oily fish which can potentially be harmful to the growing foetus and by taking a daily supplement of 10µg/d to achieve the RNI during pregnancy (23).

4.5.6 Calcium

Calcium intake was just below the UK national average (22) and RNI, with this group of women consuming on average 95% of the RNI. Availability of calcium to the foetus is thought to affect foetal BMC (32), and should the mother have had 2 pregnancies in quick succession, she is not only putting her own bone health at risk but also that of her second child should her lack of calcium stores be unable to adequately provide for her growing foetus.

4.5.7 Iodine

The RNI for women in the UK is 140µg/d and the result in table 7 shows the mean intake of 113µg/d for the South Asian women. This average is also below the UK national average as reported in the NDNS (22). Only 81% of the RNI for iodine intake is met in the South Asian women's diet and a recent piece of research found that 69% of 14-15 years old in the UK fall short of the urinary iodine requirement of 100µg/l. These reduced levels of iodine intake could have negative effects on the neurodevelopment of the foetus (45, 78), cretinism (40) and negative pregnancy outcomes of low birth weight and premature birth (44), foetal loss and still birth (40).

4.5.8 Zinc

Zinc intake was adequate meeting the RNI by 108% but was slightly below the UK national average (22). As there is no increased requirement during pregnancy these women should have an adequate intake to fully support the needs of the foetus should they become pregnant.

4.5.9 Selenium

Selenium intake was very low and only met 58% of the RNI, fully supporting the evidence that selenium intake in the UK is thought to be declining (79). While some recent research found that a low serum selenium concentration in early gestation increases the risk of pre-term delivery (80) and predicts lower birth weight (81) more research on selenium intakes status and negative pregnancy is warranted before any claims can be made with any certainty.

4.6 Summary

In summary energy intakes were adequate for non-pregnant women and the proportions of energy gained from CHO, fat and protein were within the recommendations. These results are consistent with a healthy mean BMI score of 22.64kg/m^2 for the women and having a healthy BMI before pregnancy is advised (23). While vitamins A, C and most of the B vitamins were adequate not only for non-pregnant women but also for any pregnancy period, some of the most important micronutrients required in the peri-conceptual period and during the first trimester during pregnancy to prevent illness and foetal deformity were inadequate. Folate intake, while adequate for non-pregnant women, did not meet the increased intake required in the peri-conceptual period nor in the early stages of pregnancy. Iron, vitamin D, calcium, iodine and selenium intakes were all below the RNI for adult women and should the women enter pregnancy, consuming inadequate amounts of such vitamins and/or being deficient in such nutrients would put the health of themselves and their foetus at increased risk.

Iron deficiency anaemia resulting from prolonged inadequate iron intake can increase the risk of premature delivery and giving birth to a LBW infant (26), while an inadequate supply of vitamin D in utero can increase the risk of miscarriage, pre-eclampsia and premature birth (34). A maternal diet low in calcium may restrict foetal BMC (32) and a mild to moderate deficiency of iodine can potentially damage brain development during the first half of pregnancy (45).

While chapters 3 and 4 have reported nutrient intakes both from the diet and in supplement form and the effect nutritional adequacies and inadequacies may or may not have on adverse birth outcomes, the reasons underpinning dietary choices have not yet been explored. Chapters 5 and 6 will report the analysis from the two focus groups and

the seven individual semi-structured interviews offering factors which influence diet during pregnancy for South Asian women living in Bradford.

CHAPTER 5

BELIEFS, ROLES AND FOOD CHOICES OF SOUTH ASIAN WOMEN: FOCUS GROUP QUALITATIVE RESULTS

5.1 Overview of the chapter

This chapter is separated into two main parts, the session details, participant details and thematic analysis for focus group 1 are reported first followed by focus group 2. All of the data analysed and reported in this chapter were collected in collaboration with the UR project (see Fig 1) and therefore the focus groups were planned with the aims and objectives of the UR project in mind. Much of the analysis is not specific to the pregnancy period in line with aims and objectives of this study (see aim 2a paragraph 1.10) and therefore not all of the thematic network will be explored in this thesis. For each focus group the global thematic network will be shown visually in its entirety and each global theme will be briefly discussed drawing in the organising themes which are appropriate to the aims of this study. Each relevant organising theme will then be discussed along with the relevant basic themes with quotes being given. The criteria to include organising and basic themes in this thesis were that they should include the shopping for, preparation, serving and consuming of food and/or should relate to a factor affecting diet, nutrition or food choice during pregnancy. After each organising theme and the surrounding basic themes have been described, some factors affecting food choice during pregnancy which have been identified from the analysis will be offered. Both the focus groups were audio recorded and transcribed verbatim and the transcripts were analysed for emergent themes using a latent and inductive approach (71). Full details of the methods used for the analysis are described in chapter 2.

5.2 Aim and plan of Focus Group 1

In line with aims of the UR project and with the aim 2a of this study (see paragraph 1.10) a plan to explore family roles, food and shopping experiences of South Asian women was developed for focus group 1 (see Fig 7). The plan was split into 4 main subject areas (shopping, food preparation, meal-times and food choice) for the focus group session and points of interest for each main subject were noted down. This plan was not to be followed rigidly but to be used as a prompt for the facilitator for the group to facilitate the discussion.

Fig 7. Focus Group 1 - Plan

1. Shopping

When do you shop? Why? Availability/time?
Where do you shop? Price?
Product availability? Fresh/Convenience?
Fresh vegetables and herbs or dried?
Do you feel you can get everything you want from your chosen shop?
Who does the shopping? Alone or as a family?
Who chooses the food item and menu?
Family favourite dishes?
Do you think about nutrition when considering food items i.e. low fat-low salt?
Do you consider nutrition when choosing a meal or menu?
Do you have takeaways? How often? What do you prefer?

2. Food Preparation

Do you like cooking?
Who helps out with food preparation?
Fresh ingredients?
Do you cook traditional food?
Has your methods changed since the way your grandmother cooked? How?
Do you consider healthier methods of cooking?
Do you feel under pressure to choose healthier options?
Do you think healthier options have had an impact on taste?
Does anybody in the family insist on butter instead or margarine etc.?
Has your preparation changed since you have moved to the UK?
Do mothers/aunts help out with the cooking? Do you agree with her methods, do you have a say what is cooked? How often might they help out?

3. Meal times

What is your meal pattern like?
Does this change on certain days or at the weekend? Do working members of the family dictate these times?
Has your meal pattern changed since having a baby?
Is you first priority to feed your baby? Do you give yourself enough time to eat?
Do you sit as a family? Are children fed first? Do you take time to eat?
Do children eat the same food as the rest of the family?
How is food served up? Do you plate up or help yourself buffet style?
Do you snack between meals? What do you have? Do you consider healthy options when choosing what to have? Did this change a lot during pregnancy?
Do you have meals with other members of the family?

4. Food Choices

Healthy eating! Are some family members more bothered by this than others? Does this affect shopping choices i.e. white/brown bread/flour?
What do you drink at meal times?
How often do you drink tea/coffee? Did this change during pregnancy?

5.3 Focus Group 1 Session details

The first focus group was held at the Surestart Barkerend Childrens Centre in Bradford. The total running time of the group was 49 minutes. The session was held in a large room. Food and drinks were available to the women throughout the session and women left the circle for no more that 15-20 seconds to do so and they could hear the conversation the whole time they were away. The low soft chairs were arranged in a

circle and there was a knee height table in the centre of the circle. The facilitator sat as part of the circle and the recording equipment was placed at her side. There were 4 children attending the focus group and they were placed in front of their mother in the centre of the circle with some toys.

5.4 Participants

The participants were recruited as detailed in chapter 2. Four participants and their infant (four in total) attended focus group 1. Fig 8 below describes how none of the women except 1 described their first language as English. Three had good spoken English and 1 participant had very limited spoken English. One facilitator was present throughout the focus group and a member of the SureStart centre acted as a translator for the non-English speaker. The non-English speaker could understand more English than she could speak and therefore the translator was only needed when the participant wanted to add to the conversation. The translator however did not directly translate but gave her description of what the participant had just said. Despite having a translator I think that the non-English speaker found it difficult to join in and left the session after 40 minutes. Because of this no comments from Aamina were included in this thesis although her comments were included in the analysis process. The remaining three participants in focus group 1 contributed to the session in equal amounts, however only the most eloquent and detailed quotes will be reported in this thesis because the size of the thesis is limited. All of the women lived with their partners and children and Cala also had her partners parents living in the house. Cala was also the only participant in focus group 1 who had her own mother living in the UK. During the focus group most of the women breastfed at some time during the session which seemed very natural and comfortable and helped to emotionally bond the women.

Fig 8. Focus Group 1. Participants details.

Participant	1st Language	Family members in the household	Place of Birth	Other family members in the UK
Aamina	Urdu	Not reported	Not reported	Not reported
Badia	Urdu	Husband & 2 children	Pakistan	Brother & Aunt
Cala	Punjabi/English/Urdu	Husband & children & In-laws	Britain	Her Family and In Laws
Daisha	Pushtu	Husband & 4 children	Hong Kong	In-laws

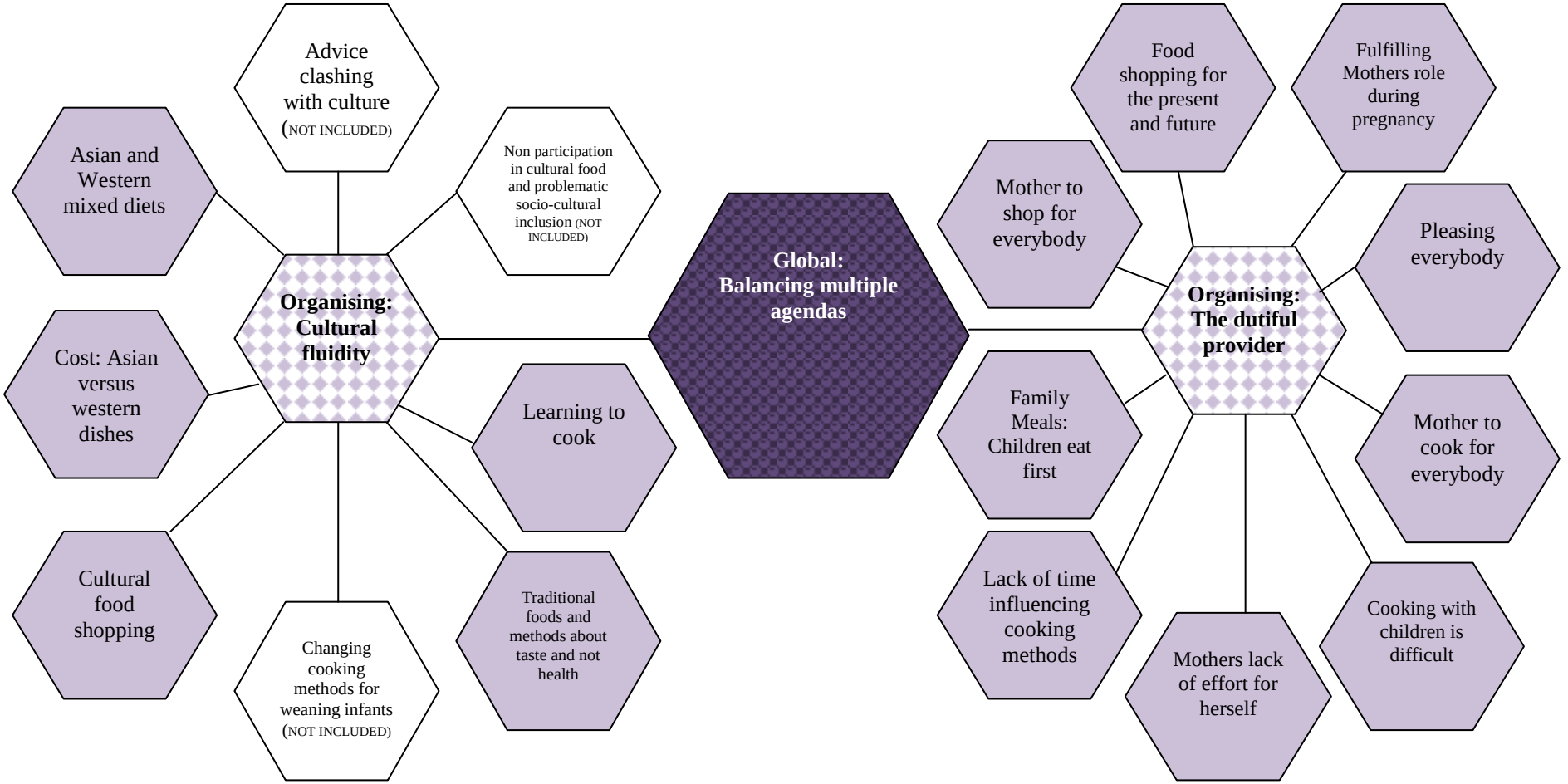
5.5 Global theme: Balancing multiple agendas

The global thematic network for focus group 1 can be seen in fig 9. The emerged global theme from the analysis of focus group 1 was that the mothers spent much of their time balancing multiple agendas. The multiple agendas that were identified in the analysis that need to be balanced by the mothers were:

- the different food preferences of all the family members
- the physical limitations of pregnancy against the need to perform the duties expected of the mother,
- the several duties expected of the mother
- time and duties
- the traditions of both the Asian and Western culture in terms of food choice, current advice and parenting.

The organising and the basic themes underpinning the global theme will be discussed.

Fig 9. Global Thematic Network for focus group 1.



Footnote: unfilled themes are not described in full in this thesis.

5.5.1 Organising Theme: The dutiful provider

The organising theme 'The dutiful provider' describes how the mothers were the main provider of the food and childcare in the home and they did this as a matter of duty.

The mothers were responsible for the planning, shopping, cooking and serving of the meals and snacks while balancing the food choices of all the family members. The analysis highlights how the mothers managed several food and meal choices from all of the people in the household which was time consuming

5.5.1.1. Mothers to shop for everybody

The mother generally shopped by themselves most of the time. Shopping however was not only about collecting the food it was also about making sure that the mothers chose the foods that all the individuals in the household wanted.

''Well I get two loaves of bread.'' (Daisha)

''I get four different types, I get the white bread for the kids, I get wholemeal for my in-laws, we get the white baps for my husband and then we get the granaries.'' (Cala)

5.5.1.2. Mother to cook for everybody

The mothers were responsible for all of the cooking and food preparation. Sometimes they felt like they never left the kitchen.

''At about 11.30 they *(In-laws)* will have their dinner because we have our breakfast late we have our?? late, and its like we're constantly we never get away from the kitchen because you're always constantly doing something, making a snack or making dinner or making lunch or…'' (Cala)

5.5.1.3. Pleasing everybody

The collection, preparation and serving of food for the Mothers was a process that was centred around pleasing all members of the family. For most of our mothers one of the highest priorities was providing food that their children would like to eat. Cala also describes how she has changed cooking styles to provide food according to her children's tastes.

''I think it changes to what you're kids really want…'' (Daisha)

Cala has described not only providing foods for her children's individual preferences but she also has to provide meals to suit her in-laws preferences. She has told of instances where she has prepared food for the meal and her in-laws have decided that they would like something else. Cala has then had to prepare another meal. This story not only strengthens the idea that the Mother has sole responsibility for providing the meals but that pleasing everybody is paramount.

> **''I've got three different types of food on my list, I've got a son who always wants a chicken, the other one doesn't mind he like red kidney beans and stuff like that with veg and I've got my in-laws who there'll be food in the fridge, everything done and they'll say 'Oh we don't feel like eating that, make something else' *(laughs)* and you think oh God you know.'' (Cala)**

5.5.1.4. Cooking with children is difficult

The mothers had to dutifully balance all of her duties, and balancing childcare with food provision and preparation proved to be problematic. One mother described how she found it difficult to cook food while looking after the children. While this was not a strong theme, this theme has been included because it helps to illustrate and strengthen further other themes such as 'Lack of time influencing cooking methods' which have been identified in the analysis.

‘‘It is hard work. Because you’re in the middle of cooking and they start crying, and obviously you have to turn the gas off and go to them.’’ (Badia)

5.5.1.5. Food shopping for the present and future

The mothers were the main person responsible in the household for the shopping and because of this they tended to buy according to offers because they knew what they would need in the kitchen not only now but in the future. This planning for the future would ultimately save the mothers’ time and also enable the mothers’ to fulfil their duty even in the eventuality that they could not get to a shop.

‘‘Yeah but then if you only buy the things you really need or when you go and I go, I think about oh I’ll take this, you think about long term.’’ (Badia)

‘‘You are there in the kitchen.’’ (Daisha)

‘‘Yeah and you are the one thinking about it, about whatever you’re going to need in a couple of weeks, so I just like to top up and I don’t mind if I spend a little bit more on that time but at least….’’(Badia)

5.5.1.6. Fulfilling Mothers role during pregnancy

It was not apparent in the analysis of focus group 1 that should the mother be unable to shop and prepare the food that anybody else in the household would take on this duty. One mother described that during the later stages of pregnancy she was no longer physically able to undertake a large food shop and it was in fact her previous planning and stocking of food that meant that she was able to provide meals for her family.

‘‘When I was pregnant and towards the end of my pregnancy I couldn’t go shopping, first of all I couldn’t walk and secondly I needed to pee *(laughs)* and for at least two months, everything that I had in the house apart from the perishable sort of items we used everything that we had ready ?? all the tomatoes the ??? beans, you know chickpeas, you know I don’t buy one or two cans I buy a 12 pack, I buy the beans say they are on offer, I buy maybe 5 or 6 at the same time because you need them. So you don’t have to keep going out all the time to get them.’’ (Cala)

5.5.1.7. Lack of time influencing cooking methods

This balancing of other family members’ food and meal choices and balancing of duties was very time consuming and the mothers also had to balance her time with the duties expected of her. Balancing time and duties influenced cooking methods with the mothers describing how they didn’t cook every day because of the time it takes. It was unclear in the analysis of focus group 1 if this meant that the mothers bought more prepared food, cooked a meal to last a few days or if eating out or takeaways were used.

‘‘I like all the food ready made.’’ (Badia)

‘‘Because of that thing ?? with the kids, by the time your only left with bed time I prefer not to.’’ (Badia)

‘‘I don’t mind cooking sometimes, but to cook every day!’’ (Daisha)

‘‘Especially with the time to find the time to cook.’’ (Daisha)

5.5.1.8. Lack of mothers effort for herself

This balancing of time and duties meant that the mothers often put their own needs last. The mothers talked about eating breakfast once everybody else has been organised for the day, and eating snacks which were quick to prepare and eat. Often it was discussed how the mothers didn’t make the food and snacks they wanted if it was just for them because it was too much effort. The mothers told that often they ate breakfast or snacks whenever they had the time and that their breakfast was not a planned meal but more similar to snacks where they also eat whatever was quick and convenient. Badia says

that she often eats leftover from the fridge. The women describe their snacking foods as fruit, leftovers, chocolate or cereal bars.

> **‘‘I don’t have my breakfast, I’m up at 7 o’clock so they can all go to school, I don’t have my breakfast until about 10.00, 10.30. This is my sisters I baby-sit for her so I’ve got like two babies and then the only time I get to eat it’s about 10.00 - 10.30.’’ (Daisha)**
>
> **‘‘Anything, fruit, anything really. I can get my hands on.’’ (Daisha)**
>
> **‘‘Anything like in the fridge from last night or whatever *(laughs),* it’s just…’’ (Badia)**

The mothers also mentioned that if they want something to eat but that nobody else is eating that they can’t be bothered to make it for themselves.

> **‘‘And you want to grab something; you can’t be bothered to make it. I can’t be bothered to make something for myself, I can make for others but I can’t make for myself.’’ (Badia)**
>
> **‘‘If I have to make lunch for my son, I’ll go and I’ll make a chapatti for him but if I have to make it for myself, then I don’t.’’ (Cala)**

It is difficult to comment on the nutritional adequacy of the breakfast meal and snacks, but what is being highlighted here is that during the day, the mothers tend to eat very haphazardly and tend not to eat what they want to but instead eat what is quick and convenient.

5.5.1.9. Family meals: Children eat first

Often the children were fed first especially during the week. This was for two reasons. Firstly by feeding the children first the mother could get the children into bed on time and secondly by feeding the children first it meant that the mothers could enjoy eating their evening meal later without having to tend to their children.

‘‘Yeah I do, on a week day I hardly sit with them as they eat, yes is ?? and I just feed them first and then get them off to bed and then I eat on my own but then on the weekends ?? I will sit down and eat.’’ (Daisha)

‘‘When they eat, I try and get the kids to eat as well the same time as them but usually what we do is that we; I feed the kids first, when the in - laws eat generally I feed the kids at the same time and then ?? Later on I sit together. You just can’t up and down all the time with the kids.’’ (Cala)

5.5.1.10. Factors affecting diet during pregnancy

Based on the above analysis of the organising theme ‘The dutiful provider’ the balancing of multiple agendas (balancing the families food preferences, balancing duties, balancing time with duties and balancing the physicality’s of pregnancy with duties), will have some part to play in influencing diet during pregnancy. Two factors affecting maternal food choice during pregnancy may be suggested. Immobility of pregnancy affects how the mother is able to shop and therefore may affect the foods on offer to the mother at that time. It has been suggested that the mother may use more non-perishable items during this period of time because she is less able to get out to do the shopping and therefore it seems stocks of canned and dried foods may be more frequently used.

A second factor that may affect food choice during pregnancy is that the mothers tend to please themselves last. It appears in this analysis that the mothers are not relieved from their duties during pregnancy and that the mothers will make sure that everybody else if fed and cared for before she eats herself. Even then, the mother will probably eat whatever is already made or not eat at all because of the extra effort involved in making something for her.

5.5.2 Organising theme: Cultural Fluidity

Cultural fluidity or acculturaltion is the process and adaption to alien cultural forces meaning that individuals adopt aspects of the culture around them so that it becomes

part of their normality. Cultural fluidity has been evident with respect to food choice in the mothers household where both Asian and Western diets are consumed interchangeably.

5.5.2.1. Asian and Western mixed diets

The households prepared and consumed both Asian and Western foods and that within every day, some meals and snacks would be Asian and other meals and snacks would be Western. This shows that the South Asian families have adopted Western practices into their everyday lives and diets.

> **‘‘Asian or Asian mix see on a Sunday in the afternoon we have like English food and in the evening Asian. So mix.’’ (Daisha)**

5.5.2.2. Cost: Asian versus Western dishes

The mothers appear to have adopted Western meals into their diet even when they state that they find that western meals cost more to prepare. The reason for adopting Western meals is not clear especially as they appear to cost more for the women, although it could be suggested that as the children appear to have a lot of influence over the meal choice for the families that such dishes are prepared to meet the preferences of the children in the family.

> **‘‘I get, I make a lot of dishes in my house, lasagnes, pastas, all sorts , I find that I have to keep topping up with all these things, they cost actually, when you sort of ??? they cost you more than you would with your normal chapatti.’’ (Cala)**
>
> **‘‘Really!’’ (Facilitator)**
>
> **‘‘and a curry.’’ (Cala)**

5.5.2.3. Cultural food shopping

Cultural fluidity is about the moving between cultural practices and for the mothers maintaining their Asian identity is as important as adopting Western practices. This is illustrated by the mothers shopping in Western style supermarkets as well as going to the Asian supermarkets to collect halal meats and Asian spices.

‘‘I do most of the shopping at Morrisons, some ?? can’t get at Morrisons and but another trip to Asian supermarket.’’ (Badia)

‘‘Yep’’ (Facilitator)

‘‘You can’t get everything you want like meat’’ (Badia)

‘‘Oh yes, I’ve forgot that as well.’’ (Daisha)

‘‘Yeah, meat and sort of stuff as well, spices ?? You must make two trips????’’ (Badia)

5.5.2.4. Learning to cook

The mothers strived to maintain their Asian culture by learning to cook from family members and by teaching other family members the recipes they know.

‘‘So how did you learn to cook this traditional food then? (Facilitator) Well my mum always cooked.’’ (Cala)

‘‘at my house every time I cook me and my sister in law, ??? just stand by me and just watch me and I do a running commentary look this is how much I put in so what I’m going to give you now wait ‘til the meat curry, the sauce gets to this sort of colour, then put this ingredient in.’’ (Cala)

5.5.2.5. Traditional foods and methods about taste not health

Another area where mothers felt that the advice given to them did not balance with the ambition to eat traditional Asian meals was with healthy eating advice. The mothers explained that to keep the traditional taste of the Asian dished that they preferred to cook using traditional ingredients rather than healthy alternatives. The mothers prefer

cooking with and eating foods for the flavour rather than substituting ingredients for healthier alternatives. The mothers have said that they have tried to cook with the healthier alternatives but that ultimately this changes the flavour of the foods and they would prefer to have the flavour. Cala describes how she used to make her rice with ghee, then changed to vegetable oil but that after her own mother had made her rice with ghee and the texture of the rice made Cala switch back to ghee.

> **''I used to make rice with ghee and then we swapped to vegetable oil and after a long time mum I think she started using Ghee again or something ?? just looked at it and its back to the old days but from then on I stick with that.'' (Cala)**

5.5.2.6. Factors affecting food choice during pregnancy

While this organising theme *'cultural fluidity'* does not directly talk about diet and food choice during pregnancy, it highlights, that cultural fluidity itself is a factor affecting diet and food choice during pregnancy. The extent to which an individual moves between cultures will affect food choice generally and during the period of pregnancy. For the mothers, balancing the two cultures was sometimes a challenge and these challenges could influence food choice. This was highlighted more in the focus group when the mothers were discussing infant weaning but the problems of balancing the two cultures may also extend into pregnancy. Culture and food choice during pregnancy will be further discussed in the theme 'maintaining cultural identity' in chapter 6 paragraph 6.5.2.2.

5.6 Aim and plan of Focus Group 2

In line with aims of the UR project and with the aim 2a of this study (see paragraph 1.10) a plan to explore family roles, pregnancy and beliefs of South Asian women was

developed for focus group 2 (see Fig 10). This plan was not to be followed rigidly but to be used as a prompt for the facilitator for the group to facilitate the discussion.

Fig 10. Focus Group 2 - Plan

How did you feel about pregnancy?
How did pregnancy make you feel?
How did your family react to the pregnancy and birth?
Did you take supplements during pregnancy? If so what and why?
Who told you to take supplements during pregnancy?
How did you feel when you arrived home after the birth?
How did you overcome pregnancy related ailments? Are there any traditional remedies or beliefs that relieve ailements?
What did you eat during pregnancy? Did you eat anything different? Were any dietary changes conscious made?
Did your family help out with chores and childcare after the birth? If so what and what with?
Do you think your lifestyle had any effect on your pregnancy and birth?
Experiences of labour? How did the women feel about use of pain killing medication?
Where did the mothers so to for support and advice?

5.7 Focus Group 2 Session details

The second focus group was also held at the SureStart Barkerend Childrens Centre in Bradford. The total running time of the group was 54 minutes. The session was held in a large room. Food and drinks were available to the women throughout the session and women left the circle for no more that 15-20 seconds to do so and they could hear the conversation the whole time they were away. The low soft chairs were arranged in a circle and there was a knee height table in the centre of the circle. The facilitator sat as part of the circle and the recording equipment was placed at her side. There were 6 children attending the focus group and they were sat in a toy area on the perimeter of the circle. If the children became upset they were brought back to their mother by a member of the SureStart staff who was helping with the group.

5.8 Participants

The participants were recruited as detailed in chapter 2. Five participants (3 from focus group 1 and 2 newly recruited women) and their infants (five in total) attended focus group 2. Fig 11 below describes how three of the women did not describe their 1st

language as English while 2 did. However all of the participants had good spoken English and a translator was not required in this focus group. All of the five participants in focus group 2 contributed to the session in equal amounts, however only the most eloquent and detailed quotes will be reported in this thesis because the size of the thesis is limited. All of the women lived with their partners and children and Cala also had her partners parents living in the house. During the focus group most of the women breastfed at some time during the session which seemed very natural and comfortable and helped to emotionally bond the women.

Fig 11. Focus Group 2. Participants details.

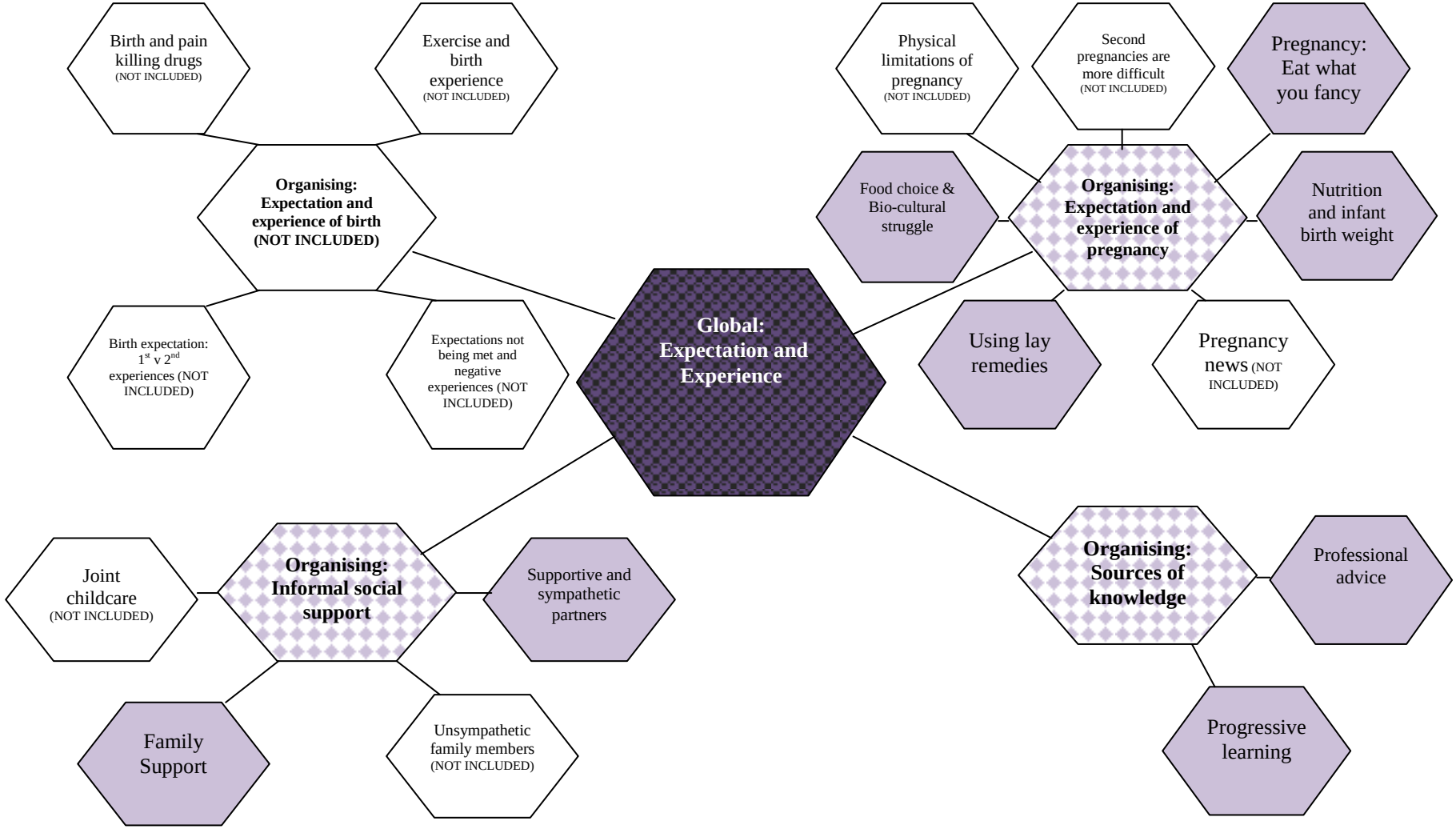
Participant	1st Language	Family members in the household	Place of Birth	Other family members in the UK
Badia	Urdu	Husband & 2 children	Pakistan	Brother & Aunt
Cala	Punjabi/English/Urdu	Husband & children & In-laws	Britain	Her Family and In Laws
Daisha	Pushtu	Husband & 4 children	Hong Kong	In-laws
Elmira	English	Husband + 2 children	Britain	Parents
Faaiza	English/Urdu/Punjabi	Not reported	Not reported	Not reported

5.9 Global Network

The global network for focus group 2 can be seen in fig 12. During the pregnancy and birth period the mothers have described how their expectation has and has not met their experiences. This has occurred within the organising theme ‘informal social support’ where the mothers had expected and experienced joint childcare with their partners when the mothers started back at work. In the organising theme ‘expectation and experience of pregnancy’ the mother’s expectation that she could eat whatever she wanted during pregnancy was not always the experience because her own biology

would not allow it. For the mothers there was also the expectation that her nutrition during pregnancy would determine the weight and health of her infant. In the birth period the women had many expectations where the mothers expected an easier labour because they had done some exercise and expected that their second births would be the same as their first. The other basic themes described the mothers experiences of pregnancy, birth, support and sources of knowledge. The organising theme 'expectation and experience of birth' and the surrounding basic themes have not been described in this thesis as they were not relevant to the aims of this study. All other organising themes have been explored and the relevant basic themes described.

Fig 12. Global Thematic Network for focus group 2.



Footnote: unfilled themes are not described in full in this thesis.

5.9.1 Organising Theme: Informal Social Support

Much of the support that the mother's received during the pregnancy and birth period into parenthood was from their informal social network in particular from their family members especially the maternal and paternal grandmothers, and partners. While the mothers received this support and advice, it was not always used by the mothers because of the difficulty and practicality of enforcing the advice. For some mothers the advice given was not to support the mothers but to act as instructions for the mothers to follow. At other times some of the mothers felt that family members and partners could be unsupportive and unsympathetic during their pregnancies but while the mothers described how family members and partners would say **''Everybody has babies, everybody goes through pregnancy'' (Cala)** this was not reported in the context of food or a factor affecting food choice and so it has not been described in this thesis.

5.9.1.1. Family Support

The mothers receive a lot of advice and support during their pregnancies and post birth from their family members including the maternal and paternal grandmothers (82). The type of support from maternal and paternal grandmothers was identified as instrumental support (83) which describes support with practical tasks and helping to care for the infant. During pregnancies the grandmothers did offer some advice concerning the diet and while some mothers choose not to follow the advice, others felt that the advice offered felt more like instructions than advice. Badia described the advice she received and how she did not follow it, while Daisha describes how the advice felt more like instructions.

‘‘My mother-in-law, she’s abroad but when she knew the first time when I was pregnant with my first one she used to say make sure you have a glass of milk and an apple every day *(laughs)* So it was that, but I didn’t really do it, I didn’t like the milk.’’ (Badia)

‘‘It may be more like do as I ask you to do rather than giving you advice.’’ (Daisha)

5.9.1.2. Supportive and sympathetic partners

The analysis found that the partners of the mothers made some attempt to offer instrumental support and advice during the mothers pregnancies. As part of the instrumental support offered the partners would often bring the mothers food when they were ill or too tired to get food themselves. One mother Cala describes how her supportive partner would make her some food in the morning.

‘‘I used to try and eat it, and to be truthful I appreciated the fact that he was doing all that, but you know that when you think this should be so special I should enjoy it, I couldn’t because I felt sick.’’ (Cala)

Another partner offered support by stating that the mother did not have to cook if she felt too ill or tired, instead he would get a takeaways for the evening meal.

‘‘he always said take your time, make yourself feel better or whatever, if you can’t cook, fine. So he used to get take-out and everything so I had no pressure.’’ (Badia)

Badia also described that her partner would tell her to eat healthy for the sake of her baby’s health but that she did not always feel like preparing the healthy food. Her husband would bring her food if she craved it but this highlights how advice can be given with good intention but that if it is not practically possible for the mothers then advice alone may not be that effective at supporting the mother.

‘‘Actually I get shouted from my husband as well; if you don’t want to eat for yourself, don’t eat it but at least for the sake of the baby.’’ (Badia)

‘‘So I just listened from one ear and goes from another so… who was going to do it for me? So I never bothered but if I wanted something, like craving something, he used to make sure that he would bring it for me. One day I was really craving for chick peas and like chad, chick peas and spices and everything and I really, really wanted it so he took me so forget making it I’ll take you, we went to ?? (takeaway)’’. (Badia)

5.9.1.3. Factor affecting food choice during pregnancy

Advice alone can be ineffective. Advice can aid the mother with decision making but that if the advice cannot be practically implemented it can be useless to the mother. Some advice may need to be given together with practical support.

5.9.2 Organising Theme: Sources of knowledge

The women in this focus group sought out and received support from professional figures such as midwives who attended the local SureStart centre. The women sought out such advice not only to gain knowledge but also to help reassure themselves that they were doing the right thing during pregnancy and to reassure themselves of their ability as new mothers. Much of the women gained reassurance in their own abilities as a mother by learning from their own experience and the basic theme ‘Progressive learning’ has not been reported in this chapter because it is better illustrated in chapter 6 paragraph 6.5.4.2.

5.9.2.1. Professional advice

Professional advice described as ‘‘provided by a variety of medical, nursing, and allied professionals’’ (84) as cited in (85) has been sought out and used by the mothers. Badia described how a midwife would help her with whatever she needed. For Badia this

source of advice was very comforting because she felt that there was always somebody she could turn too because she had nobody else.

> **‘‘We had a midwife here and she’s ret… I mean she is really old age, very, very wise and she was recommending it and I tried it and it really worked.’’ (Badia)**

Badia also describes how professional advice has helped her.

> **‘‘my manager, she’s a health visitor as well and she told me about that, keep Rich Tea biscuit next to your bed and before you get up, you take it and then it helps and it did.’’ (Badia)**

5.9.2.2. Factor affecting food choice during pregnancy

This organising theme ‘Sources of knowledge’ closely resembles the organising theme ‘Receiving advice and learning’ in the analysis of the individual semi-structured interviews. For the factor (sources of advice and support) affecting food choice during pregnancy please see paragraph 6.5.4.3 where the factor has been described.

5.9.3 Organising Theme: Expectation and experience of pregnancy

This focus group found evidence that pregnancy for the mothers was a joyous occasion (basic theme ‘Pregnancy news’) and that for the mothers each pregnancy was different and affected them differently. In the basic theme the ‘Physical limitations of pregnancy’ the mothers discussed how being pregnant made sleeping difficult and how second pregnancies were more difficult than the first (basic theme ‘Second pregnancies are more difficult’) because the mothers still had to care for another child while feeling the tired effects of pregnancy. These three basic themes are not described in this analysis because they did not relate to food or a factor affecting food choice during pregnancy. However food choice during pregnancy was influenced by the bio-cultural struggle the

mothers faced. This is where the mothers' expectation and experience of pregnancy differed because what they wanted to eat differed from what their own biology would allow. When the mothers bodies did allow them to eat as they wished, the mother described how they would eat whatever they felt like more in-line with their expectation of pregnancy.

5.9.3.1. Pregnancy: Eat what you fancy.

The mothers agreed that while they were pregnant they generally ate whatever they felt like and foods like cheeseburgers and chicken and chips from the takeaway were mentioned. One mother Daisha told that before she was pregnant she would try to limit her calorific intake but that while she was pregnant she would just eat whatever she wanted.

> **''Well before I was pregnant I tended to look at the calories and I tried not to like eat but during pregnancy I used to eat like you know a slice of cakes it doesn't matter I'd just eat it and chocolate it doesn't matter but after pregnancy I just watching what I eat again. But during pregnancy it wasn't bothered take it as it comes it doesn't matter.'' (Daisha)**

Cala discussed that she **''tried to be healthy''** possibly indicating that she did not succeed, highlighting that while the mothers are aware of healthy eating practices and that they tried to be healthy during pregnancy, that ultimately eating whatever they felt like eating was more important.

5.9.3.2. Food choice and biocultural struggle

The biocultural struggle of pregnancy is a factor affecting the diets of pregnant women. The women reported that the smells of tea and coffee and the smell of meat being cooked made them ill. For some women this meant that they were unable to cook.

‘‘I couldn’t cook onion not even draw onion.’’ (Cala)

‘‘Until I realised that thing was being made for the chicken .. basic sauce was same with veg ?? until I realise that sauce was being made for chicken I was fine with it and as soon as I realised I would start being sick.’’ (Cala)

Again for some households this meant that takeaways were ordered instead of a meal being cooked.

‘‘with the second one I couldn’t make chapattis, I couldn’t smell the chapattis so we had to take out every day.’’ (Badia)

5.9.3.3. Use of lay remedies during pregnancy

Some of the mothers relied on non-medical interventions to ease the symptoms of pregnancy and some of these interventions were food based. Badia and Elmira suffered from pregnancy related nausea and they both used food interventions to help make them feel better. Badia found that a Rich Tea biscuit helped and Elmira had toast and warm milk and that helped her.

‘‘And I had heartburn but I didn’t rely on Gaviscon because I didn’t like the taste of that, putting it into my throat so. It’s just as good, a Rich Tea biscuit or something.’’ (Badia)

‘‘I used to like my toast with milk, I needed a glass of milk nice and warm and then dip toast in milk and then eat it.’’ (Elmira)

5.9.3.4. Nutrition and infant birth weight

Some evidence was found in this group that women related what they ate during pregnancy and the size of their body to the birth weight of their child. Cala describes that during her pregnancy she was unable to eat very much because she suffered from sickness throughout the duration of her pregnancy. Cala believes that this is why her infant was not very heavy at birth.

‘‘I had to because you had to eat. Still when my son was born he was very long but he was only 5lb when he was born ??? he should be at least 8 – 9 lb.’’ (Cala)

Daisha also associated her diet to the birth weight of her infant but interestingly she also associated her body weight to the birth weight of her infant. Daisha describes how she stopped monitoring her calorific intake during pregnancy and states that she got ‘‘**really big’’** which is why she believes she had a big baby.

‘‘Well before I was pregnant I tended to look at the calories and I tried not to like eat but during pregnancy I used to eat like you know a slice of cakes it doesn’t matter I’d just eat it and chocolate it doesn’t matter but after pregnancy I just watching what I eat again. But during pregnancy it wasn’t bothered take it as it comes it doesn’t matter.’’ (Daisha)

‘‘I was really big as well with this pregnancy I was really big ??? and he was 9 lb 6 when he was born.’’ (Daisha)

5.9.3.5. Factors affect food choice during pregnancy

Pregnancy ailments are one factor which affects food choice. Aliments such as heartburn or nausea often lead to nutritional lay remedies being used. Pregnancy nausea also can limit the diet because the mother does not feel like eating too much or the mother may steer away from some food making her feel nauseous and eat other alternative instead.

Another factor which may influence diet during pregnancy is that the mothers felt unrestrained by cultural norms to be thin and therefore allowed themselves to have a very unrestricted diet. This is similar to the factor ‘freedom from constraints’ which is reported in paragraph 6.5.2.4 in chapter 6.

5.10 Summary

A summary of the results from all of the qualitative analysis including the two focus groups and the individual semi-structured interviews will be given at the end of chapter 6. See paragraph 6.6.

CHAPTER 6

BELIEFS, ROLES AND FOOD CHOICES OF SOUTH ASIAN WOMEN: INDIVIDUAL SEMI-STRUCTURED INTERVIEWS QUALITATIVE RESULTS

6.1 Overview of chapter

This chapter reports the analysis for the individual semi-structured interviews. All of the data analysed and reported in this chapter were collected in collaboration with the UR project (see Fig 1) and therefore the individual semi-structured interviews were planned with the aims and objectives of the UR project in mind. Much of the analysis is not specific to the pregnancy period in line with aims and objectives of this study (see aim and objective 2a paragraph 1.10) and therefore not all of the thematic network will be explored in this thesis. The global thematic network will be shown visually in its entirety and each global theme will be briefly discussed drawing in the organising themes which are appropriate to the aims of this study. The criteria to include organising and basic themes in this analysis were that they should include discussion on the shopping for, preparation, serving and consuming of food and it should also relate to a factor affecting food choice during pregnancy. Each relevant organising theme will be described and the basic themes underpinning the organising theme, which are of specific interest to the aims of this study will be discussed. The individual semi-structured interviews were audio recorded and transcribed verbatim and the transcripts were analysed for emergent themes using a latent and inductive approach (71). Full details of the methods used for the analysis are described in chapter 2.

6.2 Aim and plan of Individual Semi-Structured Interviews

In line with aims of the UR project and with the aim and objective 2a of this study (see paragraph 1.10) a plan to explore family roles, pregnancy and beliefs of South Asian women was developed for the individual semi-structured interviews (see Fig 13). This plan was not to be followed rigidly but to be used as a prompt for the facilitator for the group to facilitate the discussion.

Fig 13. Individual Semi-Structured Interviews - Plan

How did the mothers' feels about pregnancy and did the reality meet up to the expectation
Were the mothers aware of healthy food guidelines during pregnancy.
Did they know the benefits of a healthy diet?
How did the mothers own upbringing influence their own parenting?
What did the mothers eat during pregnancy and why?
How do the mothers describe parenting and how did they see their role and the fathers role in parenting.
When did the mothers feel like they became a parent?
Is there anybody else involved in the parenting of the child?
Who did the mothers receive support and advice from?
What was the advice?
How did other family member react to the pregnancy news and what were their wishes?
What would the mothers describe as a healthy baby?
How did mothers make decisions concerning their baby's needs?
Were the mothers offered advice to take supplements during pregnancy? If so who by and how did they feel about this?
How did the mothers feel about their body changing during pregnancy?

6.3 Individual Semi-Structured Interviews details

The individual semi-structured interviews were held at the Surestart Barkerend Childrens Centre in Bradford. Seven interviews were held on the same day and the average time of the interviews was 44 minutes. The first 3 interviews lasted for about 52 minutes but the final 3 interviews were much shorter. The interview with Jalpa had to be ended earlier because the following interview participant had arrived early. The interview with Kali only lasted for 24 minutes because she had to leave early to collect her son and the interview with Leela lasted for 36 minutes because she seemed reluctant to discuss her stories in great detail. The session was held in a small room with a table and hard chairs. The facilitator sat on one side of the table and the participant sat opposite on the other side. The audio recorder was placed on the table. Food and drinks

were set up outside the interview room and it was available to the participant throughout the interview. The women generally brought their drinks and snacks into the interview room at the beginning and did not leave to get anymore during the interview. All of the women except 1 had their infant with them during the interview and the women were free to breastfeed and to care for their child when needed.

6.4 Participants

The participants were recruited as detailed in chapter 2. Seven individual semi-structured interviews were held and one of the participants who attended both focus groups also attended the individual interview. Fig 14 below describes how all but 1 of the women described their first language as a language other than English although a second participant stated that she spoke English more than her first language. However all of the participants had good spoken English and a translator was not required for any of the interviews. All of the women lived with their partners and/or children. None of the women lived in a household with their extended family.

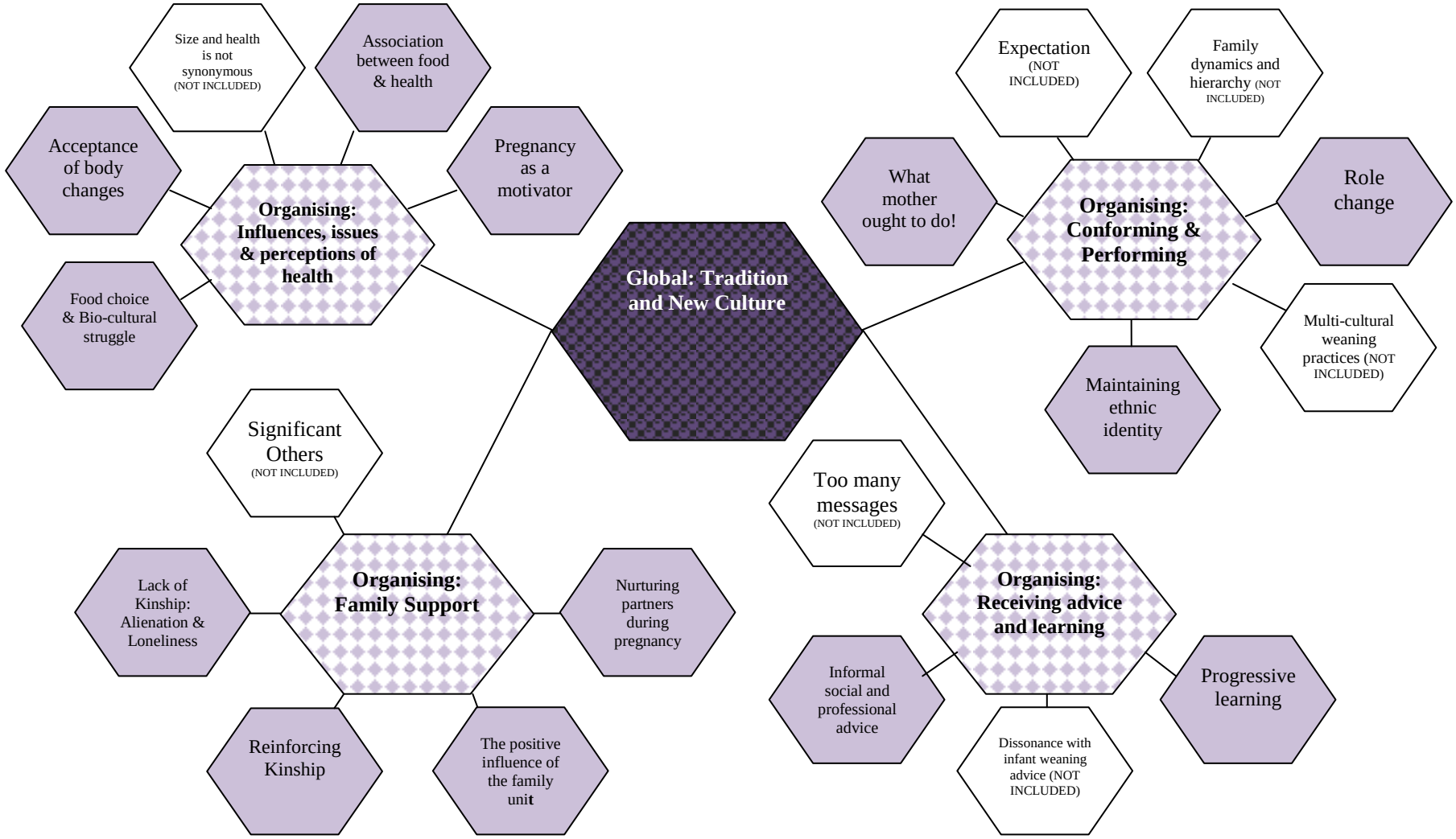
Fig 14. Individual Semi-Structured Interviews. Participants details.

Participant	1st Language	Family members in the household	Place of Birth	Other family members in the UK
Gadia	Gujarti but speak English more	Husband 1 son and 1 daughter	Bradford	Mother, Fathers and Sisters. Husbands family in India.
Badia	Urdu	Husband, 1daughter and 1 son	Pakistan	Brother in Law and Aunt
Hemal	Gujrati	Husband and 1 Baby	Bradford	Mother, Father, Sisters and Brother
Ishat	Pushtu	Husband and 3 boys	Pakistan	Mother, Sisters and In Laws
Jalpa	Urdu and Punjabi mixed	Herself, Husband and 2 children (1son & 1daughter)	Bradford	Her Father
Kali	English	Herself, Husband and 3 children	Bradford	7 Sisters and 2 Brothers
Leela	Punjabi	Herself and the Baby	Pakistan	Parents, Brothers and Sisters

6.5 Global Network

Fig 15 shows the global network for the individual semi-structured interviews. The global network has 4 organising themes (conforming and performing, external advice and learning, family support and influences and issues of health) which will be described later under each organising theme heading. Each organising theme has highlighted how traditional culture is very important to the mothers in their everyday chores, roles and in the way they receive family support. However the mothers are also keen to embrace and incorporate into their roles, expectations, family dynamics and lifestyle practices new modern methods some of which could be described as part of Western culture. This is highlighted by the mothers search for external advice and dissonance between the old and the new advice they receive. Overall the mothers want to make full and informed parenting decisions to do what is best for their child in terms of their child's health and also to allow them to fully embrace being a British Asian with the blend of western and Asian culture that come with it.

Fig 15 Global Thematic Network for the individual semi-structured interviews.



Footnote: unfilled themes are not described in full in this thesis.

6.5.1 Organising Theme: Family Support

For our mothers much of the support they received came from informal social networks (84) as cited in (85) such as family members in particular sisters, the maternal and paternal grandmothers and partners. Unlike other forms of support and advice, family support was given within the cultural norms and traditions of the mother. The mothers received both emotional and instrumental support (83) during pregnancy, birth and early parenthood from family members and this has been received both from separate individuals such as her partner or a sister and also from the family working collectively to offer the effective support required. We found that the extended family worked very traditionally as a unit which had positive benefits to the pregnant women and new mother and that such support could influence diet during pregnancy.

6.5.1.1. The positive influence of the family unit.

While this study identified family support mainly in the post-partum period with maternal and paternal grandmothers and sisters offering emotional and instrumental support, emotional support was also identified during the pregnancy period. Hemal described how her mother offered great emotional support during pregnancy.

> **‘‘I just used to get some lovely massages off my mum as well just kind of... Some what massages? Lovely massages yeah.’’ (Hemal)**

Leela describes how instrumental (83) family support can help in day to day practical tasks. She talked about visiting her parents for a good meal as she found it too much to cook a meal just for herself.

> **‘‘with me living on my own unless I go to my parents’ house where they’re cooking for everybody and I can share theirs Yup a good meal, if I’m on my own I tend to not cook OK because you just can’t I just find it’s too much to just cook for me.’’ (*Leela*)**

6.5.1.2. Nurturing partners during pregnancy

Another source of support for the mothers came from their partners where they actively encouraged the mothers to look after their health during their pregnancies. Family members offering information to the mothers has certainly been apparent within the analysis and has been explained in much more detail within the theme ‘’Reinforcing Kinship’’ paragraph 6.5.1.3. It seems that positive encouragement has been practiced by the woman’s partners by spending more time with the women and increasing the attention they give the mothers and generally looking after their emotion and physical wellbeing (83). Kali described how her supporting husband would bring her fruit and milk during her pregnancy, helping her to achieve a nutritious diet while she was pregnant.

> **‘‘the thing is you’ve got to have the support there as well, because my husband is fantastic he, if I haven’t had my fruit he will actually go and make a plate of fruit and say ‘’here you are having it’’ and it’s a nice feeling oh yeah he is there for me so, we will chit chat and have like fruit and its obviously not only the fruit it’s like you know a mil…, a glass of milk before I go to bed.’’ (Kali)**

6.5.1.3. Reinforcing kinship

Kinship has been described as the social relationship between people who are bound together by biology, either in the original genetically related meaning of biology or by a kinship modelled on a biological relationship such as that found in child adoption (86). Kinship has also been described by Hayden when describing the work of Schneider, as a symbolic system resting on the elements of blood and love (87, 88) and it is this bond of love and emotion between kin that my analysis has identified as being strengthened during our mothers pregnancies. The pregnancy gave the family members an ideal opportunity to reinforce their kinship when perhaps they would not otherwise have done so. For instance, for Jalpa, the news of her pregnancy gave Jalpa’s Father a great

opportunity to build on their existing relationship and for him to offer his emotional care and support especially since the passing of Jalpa's Mother a short time previously. Jalpa's Father offered her some practical advice that was not really based on fact but on knowledge he casually gained throughout life. She describes this not as advice but as support and when questioned as to how she felt about gaining support from her Father, she found that it was helpful because it indicated that she was not on her own. This passing on of information served much more for the Father to indicate that he cared for his daughter reinforcing the relationship between them and offered a great deal of emotional comfort for Jalpa who was feeling alone during her pregnancy.

> **''he would say so if you don't eat this food because it's not good for the baby and he would say don't do too much running because it's not good for the baby you know, do a lot of exercise but not a lot of fast ones, and have lots of soup because it's good for you it will give you energy you know stuff like that so that was quite good.'' (Jalpa)**

> **''I felt good because then I didn't feel on my own, because usually I feel a lot on my own.'' (Jalpa)**

6.5.1.4. Lack of kinship: Alienation and loneliness

Family support towards the mothers however was not always supportive and can sometimes be conditional, especially where our mothers were perceived to have shamed or disappointed the family unit. This lack of support can lead to a sense of isolation for the mother. Leela explained how due to personal circumstance she thought she may lose her family over the news of her pregnancy. This led to a very unhappy time for the participant where she felt lonely and isolated and in a difficult situation.

‘‘I met my partner and our family is into arranged marriages so there was quite a lot of difficulty there Yeah so I thought I would be disowned which I was to begin with but when they found out I was pregnant then they all accepted it after a while.’’ (*Leela*)

‘‘So the start of my pregnancy wasn’t good so I was just totally depressed Right you know so worried about losing my family.’’ (*Leela*)

Leela has previously described how during her pregnancy she would go round to her parents’ home to have a meal otherwise she would not bother just for herself. Below Leela describes the types of foods she ate during pregnancy which was all low preparation snack foods.

‘‘You know I try I try to put in other things like yoghurts and things that I think may help Yeah but otherwise I will just usually like sandwiches and Yeah things like that Yeah or sometimes unhealthy foods like chips and burgers.’’ (Leela)

6.5.1.5. Factors affecting diet during pregnancy

The amount of support that the mother has during her pregnancy, whether it be by partners, maternal or paternal grandmothers or sisters may have an influence on the mother diet during pregnancy. One factor that may influence diet during pregnancy is the social facilitation affect, where pregnant mothers will eat meals as part of a family (nuclear or extended) (89, 90). This has been demonstrated in this thesis by highlighting that a lack of kinship can lead mothers to not cook substantial meals for themselves whereby the mothers tend to eat quicker to prepare snack foods.

A lack of kinship can also leave the mothers feeling lonely and isolated. Loneliness therefore is offered as another factor affecting diet during pregnancy. It has long been documented that emotions can interfere with appetite and food choice and can therefore alter food consumption and the diet (57, 67).

Another factor affecting diet during pregnancy would be positive encouragement offered by nurturing kin. Family support has been shown to increase walking in leisure time in Portuguese adults (91) and therefore the positive encouragement of nurturing kin may encourage the mothers adopt healthier food consumption for the health of themselves and their unborn child.

6.5.2 Organising Theme: Conforming and Performing

Conforming and performing is about the mothers doing what is expected of her by the family and society, and includes the roles and chores that the mother has to undertake. Much of what the mother has to do is based on social and cultural norms, however this organising theme has also identified where the mothers want to embrace new ideals and ideas such as within the roles of the individuals in the household, and also where the mothers are struggling to hold onto their traditions and cultural norms such as in infant weaning advice.

The analysis of the individual semi-structured interviews also identified that an extended family hierarchy exists. The analysis found that the partners of the mothers generally had to conform to the wishes of the extended family and that the mothers wishes were put aside by her partner in favour of those of the extended family. There was also a hierarchy that existed between the maternal or paternal grandmothers and the mothers, with the grandmother having more status than the mother. This could often make parenting difficult for the mothers as advice and practices shared by the grandmothers to the mother could not easily be disregarded as this may have caused offence. Such advice and assertion of authority by the grandmothers did not appear in our analysis to have happened during pregnancy. The evidence was more centred around infant feeding and so is not discussed in this thesis.

6.5.2.1. What Mother ought to do!

The analysis identified that there were many roles bestowed onto the mothers and that the mothers were often relied upon by partners and other family members to undertake these tasks. The mothers were identified as the primary carers of the children. This was a role they were happy to take on and it involved caring for every need of the child including feeding, bathing, sleeping and looking after their developmental and emotional needs. Badia talks about being relied upon by her family to provide and care for her children. She sees this as her primary role and says that she is a responsible mum and everybody relies on her to care for her children.

> **''they know like the kids been fed, bathed, sleep, everything is on time, everything is there for them Yeah and they know I am a responsible Mum, they can rely on me for everything and anything and they do.'' (Badia)**

Another task bestowed onto the mothers was to provide their child with nutritious food and the mothers discussed at length the food items and methods they used to get their child to eat nutritious food. During pregnancy the task to provide the unborn child with nutritious food was more centred on how the mothers felt. This analysis found that the point at which the mother begins parenting and caring for the child varies between mothers. Some mothers view their child as having separate needs to them as soon as they become pregnant or even before, while others to not believe they begin parenting until their baby is born or when they get home from the hospital. The point at which the mother begins parenting may affect her dietary intake during pregnancy as the mother attempts to provide the best nutrition for her unborn child.

‘‘when you find out that you are pregnant because you have to you know make sure you do the right things… well you try and do the right things but it doesn’t always work that way.’’ (*Leela*)

‘‘I think it helped a great deal you know and… and kind of knowing that my baby would be healthy as well Right so it wasn’t just about me that I had to think about, Yeah there is a baby inside me Yeah that needed all the nutrition’s as well Yeah you know. Yeah. So for me it was kind of not just… you know this whole pregnancy wasn’t about me but it was about what was best for my baby Yeah what’s going to be best for… in terms of food or the right kind of food intake the right kind of fluid.’’ (*Hemal*)

Even when the women were battling against pregnancy related nausea and were having trouble eating at all, some women still reported thinking about their unborn child’s nutrition when deciding what they could possibly eat without feeling ill.

‘‘I just come off my food Yeah but yeah I try my fruit and because obviously you got to think that’s.. its not just you anymore there is a baby in there Yeah you’ve got to give a good start to the baby Yeah so.’’ (*Kali*)

The women also discussed doing what they could for their unborn child and for most of the women taking nutritional supplements was something simple that they could do to decrease risks of diseases such as spina-bifida. Hemal who took a pregnancy specific multi-vitamin and mineral, explained that this was something so simple that she could do.

‘‘for me with it being a first child I guess I took every precaution that I could take.’’ (Hemal)

Taking nutritional supplements again provided the women with a sense of security.

‘‘**OK um anything to you know as long as I’m reassured that the baby is going to be OK I’m willing to do anything then.’’ (*Leela*)**

Badia however said that she felt that taking vitamins was just another chore that she ought to do. She did not like the taste of the tablets and found it difficult to take them.

‘‘it was just the time to remember another thing’’ (Badia)

This may indicated that all the do’s and don’ts that pregnant women have to remember and implement into their lives can at times be overwhelming to the point where not all information and instructions may be adhered to.

6.5.2.2. Maintaining ethnic identity

Although this theme was not strong and only illustrated by one mother, it highlights how important it is to be culturally sensitive not to underestimate the power of cultural practices or to undermine the importance of cultural identity which can lead to alienation and resentment within groups of people in our society. This weak theme has been included because it is strengthened by the basic themes ‘cultural food shopping’ (paragraph 5.5.2.3) and ‘learning to cook’ (paragraph 5.5.2.4) in focus group 1. While the comment from the mother was mild the possible reasons behind the comment could be very insightful. When the mother was asked what foods she ate during pregnancy she replied that she would have a healthy breakfast a sandwich at lunchtime and a curry in the evening.

> **‘‘Yeah because I still need to have a curry in the evening. I wouldn’t have a curry twice a day. Right. You know I used to have a really healthy breakfast Yeah and then I used to have um a sandwich at lunchtime and in the evening I would have a curry. But I would have that and I didn’t let that stop. It wouldn’t be spicy but I would eat.’’** ***(Hemal)***

The overall feeling of this comment was that the mother felt that she had to defend having a curry in the evening. She purposefully stated that she would have a ‘’healthy

breakfast'' and a sandwich at lunchtime indicating that she possibly thought that curries are unhealthy or too spicy during pregnancy. This was also indicated by the mother saying that she ''wouldn't have a curry twice a day'' as if it was too unhealthy or spicy to have it any more than once. Interestingly however, although this comment indicates that she possibly thought that curries were unhealthy and too spicy, she also strongly stated that she would not let this stop.

6.5.2.3. Role Change

The family hierarchy and the roles that fit it are changed during pregnancy. Jalpa commented how her family's attitude towards her changed while she was pregnant and that she was given more attention.

> **''Um before I was pregnant um I find that little bit more attention as well. I got that like ''let's look after her for a little bit'' and thinking yeah make the most of it.'' (*Jalpa*)**

The language used by the participant to demonstrate her families attitude to her pregnancy ''let's look after her for a little bit'' indicates her change in status within the family, she has increased her status from somebody who does the chores for her family to somebody who will receive some attention and be looked after. However the fact that the participant was thinking ''make the most of it'' demonstrates that this change in status and changed behaviour towards her is only temporary.

> **''Well we've got like quite a lot of family problems and um it's like the family problems just went away, just went away and it was quite good.'' (*Jalpa*)**

Jalpa told us how her father ordered that she no longer had to do the housework and cooking while she was pregnant.

‘‘when I was expecting it was like me dad said no you don’t she doesn’t have to do the house work or I don’t have to go out and have more responsibilities like these lots… little bit of responsibilities, they were just taken away from me Right without you know me thinking Oh god I’ve got to do this this.’’ (Jalpa)

However, it was not clarified who took on the responsibilities within the household or the effect that the change had on the household as a unit.

Apart from being relieved from household duties it seems that the family also allowed her to please herself more. Jalpa tells how her family are always telling her that she eats too much, but while she was pregnant they did not comment, allowing her freedom to choose what she eats when she wants it without feeling intimidated and that she is being watched or judged. There is a sense that she enjoyed being left to her own devises without trying to conform to the constraints of others.

‘‘Well when I wasn’t pregnant I actually do eat a lot… I’m just… I love food, food is my thing but when I eat a lot they just look at me and thinking where does it all go or all they will just say ‘’why do you eat so much for you know just eat the right amount’’ and thinking no food if food eat it, Ya but when I was pregnant they didn’t say anything because I am actually eating not just for myself I eating for the baby as well so they didn’t really say anything. So that was cool.
I ate all the time but I wasn’t eating just for one person, because usually I do eat a lot but this time I was eating twice as much but nobody can tell me ‘’oh god you eat a lot’’ but it was a reason this time.’’ (*Jalpa*)

Being pregnant put this participant on a pedestal and relieved her of duties both physical and emotional to the point that even comments to degrade her self-esteem were ceased. It is possible therefore that a pregnancy offers some women a chance of freedom and a break from the daily chores and responsibilities that their families expect.

6.5.2.4. Factors affecting diet during pregnancy

One factor that may affect diet during pregnancy is when the mother first begins parenting. This may happen before she becomes pregnant and she may begin to prepare for parenting and pregnancy by taking dietary supplements or by giving up alcohol etc. For many women, parenting will not start until they find out they are pregnant or they may not acknowledge their unborn child as having separate needs to themselves until later in pregnancy or until the baby is born. The mothers' lack of consciousness concerning their parenting role may prevent the mother making conscious choices about her diet and food choices during her pregnancy.

For some of the mothers, pregnancy offers a freedom from constraints where the mother is able to eat whatever she likes without judgement by others and she is relieved of duties during pregnancy. This may affect her diet and food choices because she feels able to eat whatever pleases her.

Being relieved of some duties may also affect her diet. Others in the household would have to take up the food preparation and cooking duties and this may alter the meals offered to the family. However the dynamics of the change in duties in the household was not fully explored and therefore this suggestion of a change in meals is a speculation which warrants further investigation and therefore not a factor affecting diet.

Although not a strong theme identified in the analysis, cultural norms are another factor which will affect diet and food choice. This analysis highlighted that even when one mothers believed that a food choice was not appropriate during pregnancy she would still consume the food because that was what she had always done.

6.5.3 Organising Theme: Influences, issues and perceptions of "health''

All of the women interviewed had some degree of knowledge that nutrition can influence the health of your unborn child. The knowledge that they expressed was not that of traditional origin but of modern diseases and complications which is deeply imbedded in modern western culture. The mothers also had a healthy approach to body changes (including weight gain) during pregnancy which they described as natural and normal. For the mothers such body changes were tolerable and exciting because it meant that their body was changing as it should to correctly develop their foetus. This acceptance of body change is common during pregnancy as is established in western culture (92).

6.5.3.1. Association between food and health

The participants made many references which indicated that they had some understanding that lifestyle can have an impact on health. Many of the statements were relatively general and terms such as **''because I ate healthy''** and **''if you eat the right amount of food that right amount of vitamins will go to the child''** and **''the body needs some vegetable and fruit''** indicates a basic level of knowledge about nutrition which is fairly typical of the general population. The generalised knowledge of nutrition was often linked to the health of the child in relation to their mental alertness and quite often to the child's immunity and development.

‘‘because I ate healthy with her and what the doctors said that she was going to be like yeah she’s totally the opposite because as soon as she came out she was.. her eyes were wide open and err she was like concentration on what…. and that was as soon as she was born so…’’ (*Gadia*)

‘‘Oh obviously their immunity gets better, they hardly catch any diseases or anything and um but it helps them to like... at the moment they are in a growing age, their brains are growing, they need more nutritious food to be working better in their life. So if I like… investing isn’t it, if I investing now they get benefit out of it afterwards.’’ (*Badia*)

Badia related her food choices to her own health specifically to reducing her chances of developing gestational diabetes and discussed how natural foods are better than **‘‘artificial’’** foods. She linked the natural foods to providing her with a slow release of energy.

‘‘Um fruit is obviously natural, and natural and is more healthier rather than putting artificial weight on myself and my baby with the sweetener. And plus there was a reason, that you get some people, women get diabetic during pregnancy; to avoid that as well. Ya. And um I think it’s far more healthier to keep me going.’’ (*Badia*)

6.5.3.2. Acceptance of body changes

The women viewed the changes happening to their bodies as a natural occurrence which indicated that the pregnancy was progressing correctly and healthily. Generally for the participants, putting on weight during pregnancy was not undesired and was viewed as part of the natural process.

‘‘No no because I know if you got pregnant you have to put weight on you would do anyway yeah you don’t put any weight on then Yeah this means the baby is not growing properly then. Yeah yeah. As long as you putting weight on or even if you’re not putting weight on and on the scan it showing the baby is growing normally then it’s OK.’’ (*Ishat*)

6.5.3.3. Bio-cultural struggle during pregnancy and food choices

While the participants had indicated some knowledge of healthy eating and good nutrition while they were pregnant both for themselves and for their unborn child, and while most women made some changes from their pre pregnancy food choices, the women commonly discussed the problem of pregnancy related nausea and the effect this had on their food choices. For the women pregnancy related nausea often halted their good intentions to eat nutritious food, purely because the pregnancy itself was making them sick. Hemal describes how she was more able to eat nutritious food during the 2nd trimester of her pregnancy because her choices were no longer limited due to nausea and vomiting.

> **''the beginning of the pregnancy wasn't as sort of enjoyable as the last sort of six Yeah months where you know I enjoyed it a little bit more. Yeah. I was eating a bit more healthier err because I wasn't vomiting everything I ate, it was just all out, so the first three months was disastrous and then it's just like a turning point after that.'' (*Hemal*)**

Hemal talks of the second trimester being enjoyable because she can eat healthier food and describes the first trimester as disastrous indicating that she emotionally struggled between eating what her body would accept and the food choices she wanted to make for herself and the unborn child's health. It is not surprising that in a society which is increasingly advising everybody, especially pregnant women to consume a varied healthy diet for optimum maternal and foetal health that pregnant women may feel let down by their bodies when they struggle to achieve this.

6.5.3.4. Pregnancy as a motivator

Pregnancy is an exciting and joyous period for many of the mothers. For some of the mothers interviewed this manifested as a motivational factor: a reason to alter their diet and lifestyles to healthier practices. This was not so much for the health of themselves

but mainly **''for the sake of the baby''** a term commonly used in these interviews. For such women they talked about losing weight, feeling less stressed and some decided to keep up the good practices after birth. Pregnancy encouraged Gadia to walk more with the promise that it would make the labour easier and she feels that she is more active now than before her pregnancies. However after the birth she put on weight which she blamed on her worsening diet compared to that during her pregnancy.

> **''walk about and stuff and what have you and I think that's what helped me lose a bit of weight as well Yeah could be because I was more active and now I even more active now but I think then I was eating healthier and now I'm not eating as healthy as I should be you know.'' (*Gadia*)**

Jalpa explained that for the sake of her baby she adopted healthier eating practices during pregnancy. She continued with the healthy eating routine as she feels healthier and links feeling stressed with unhealthy eating practices. She now describes herself as **''happier''** with a good diet.

> **''when I was expecting you have to eat healthy for the baby sake as well isn't it so because of me eating healthy now after after when I had the little ones I'm… I'm still sticking with the same routine Yeah and I feel a lot healthier. I'm better. Yeah. Happier. If I eat the wrong type of food at the wrong time it stresses me out.'' (*Jalpa*)**

6.5.3.5. Factors affecting diet during pregnancy

One factor affecting diet and food choice during pregnancy was knowledge that poor nutritional practices can increase the risk of adverse pregnancy and foetal outcomes. This knowledge encouraged the mothers to try to eat a good balanced diet during pregnancy.

Body image is another factor affecting food choice during pregnancy. Having a positive body image and accepting body changes during pregnancy allowed the mothers to eat what they wanted during pregnancy and did not limit what the mothers felt they could eat, unlike before they were pregnant. Whether accepting the body changes had a positive or negative influence on the diet is unclear from this analysis.

However the biology of pregnancy (another factor) often did limit what the mother could eat. Pregnancy related nausea meant that many of the women were unable to eat what they would have liked during certain periods of the pregnancy and often the mothers felt anxious about this because they felt unable to implement the advised dietary changes.

Motivation is another factor which can influence diet and food choice during pregnancy. The pregnancy itself motivated some of the mothers to do their best to implement good nutritional practices where they did not have the motivation before.

6.5.4 Organising Theme: Receiving advice and learning

The mothers described how there were many sources of advice to consider when making decisions about their pregnancy and parenting roles. The mothers received much of their advice from healthcare professionals as well as through informal social networks such as family, friends and work colleagues. By receiving advice from a combination of informal social networks and professional support (84) the mothers could gain traditional, modern, cultural and medical information from which they could draw upon. The mothers described how they would search for advice if they needed it. Because of the many sources of advice, often the mothers felt that there were too many messages given to them which was confusing and often led to dissonance. No mention

was made of too many messages or dissonance during the pregnancy period but the mothers found that advice on the timing of commencing infant weaning confusing and conflicting. The mothers also described that gaining information and advice was not the only method by which they made decisions about their pregnancy and parenting. They also described how they would try different methods and learned from their own experience.

6.5.4.1. Informal social and professional advice

The women received much of their advice from informal social networks including family and friends. Sisters and sister-in-laws were particularly useful for the women because of their recent experiences of pregnancy and parenting, more so than the participant's mothers, (the grandmothers) whose advice was deemed by some to be out of date and irrelevant.

> **''its what my sisters the older sisters tell me that I'm listening to more, because like what my mum says I do listen, its not like I don't, but at the moment its not at that point at the moment you see.'' (*Gadia*)**

While the participants are more likely to turn to women of their own generation to support them through pregnancy, birth and breastfeeding because their knowledge is thought to be more up-to-date, positive elements of the participant's upbringing also influences the participants parenting decisions and styles into the next generation.

Within the interviews analysis, professional advice came from doctors, midwives and health visitors as well as from community centres such as the SureStart Childrens Centre. Professional advice however does not only serve to pass on information but should offer care and support. Two mothers discussed the support they received from the Surestart centre and identified one midwife who

they felt particularly helped and supported them though their pregnancies and early motherhood. Interestingly the two participants who spoke about the midwife had lost their own mothers.

> ‘‘**And um there used to be a midwife here, she’s retired now here she used to work here.’’ (*Jalpa*)**
>
> **‘‘Well she… she was brilliant, she behaved a lot like my mum.’’ (Jalpa)**

Jalpa and Badia both did not have their mothers and both felt a sense of security at having an older wiser confidant whom they could contact anytime with concerns and questions in the absence of their own mother.

The mothers felt that the professional advice they received was beneficial to their healthy pregnancies and babies.

> **‘‘obviously you get a lot of support here you know, with the health visitors and stuff and at the hospital.’’ (*Kali*)**
>
> **‘‘I got most of my help from Surestart, I will admit it I did.’’ (*Jalpa*)**

Without much family support the mothers turned to other people outside of their families and immediate friends to find emotional support and encouragement. Leela talks about how friends at work offered her much need encouragement when her family were no longer offering her support.

> **‘‘if I didn’t if I didn’t have the support of my friends at work then I don’t know how I would have got through it really because they were just so good to talk to and they encouraged me in many ways.’’ (*Leela*)**

Jalpa discussed how she went and found out information for herself.

> **‘‘Well with the first one at first it was a bit difficult because I had to go and find the information myself because I didn’t have that support from home.’’ (*Jalpa*)**

6.5.4.2. Progressive learning

Other than knowledge gained through professional and informal social networks the women also talked about intuitive and progress learning.

‘‘the more you have you learn’’. (Kali)

Ishat also commented how you work problems out for yourself and how you learn more with each child.

> **‘‘But it is different… because I know more about than… than what I with my first one because with my first one I didn’t know anything Right I didn’t even know what a scan is Yeah when they did a… when they said you got glucose and stuff like that I didn’t know anything with my first one, because it’s my third one so you find out a bit more Ya you know aware of a bit more stuff.’’ (*Ishat*)**

Intuitive and progress learning helped to empower the mothers allowing the mothers to feel more confident about making their own decisions.

6.5.4.3. Factors affecting diet during pregnancy

A factor affecting diet and food choice during pregnancy may be the source of advice and support used by the mother. Each source of advice and support will offer different information based on the message the source is trying to convey, the previous experiences of the source and the agenda that the source has. For instance a family member will have a different set of information and agenda for the mother than a healthcare professional may have. The advice from a family member may be more centred on lay belief or the emotional wellbeing of the mother in relation to her own personality whereas a healthcare professional will be primarily concerned with the physical wellbeing of the mother and will have specific advice and messages to provide to the mothers.

Another factor which may influence diet and food choice may be the mothers previous experience of her own pregnancies. She may choose to disregard advice given to her during her first pregnancy or she may have gained more advice from her previous pregnancy to bring towards her subsequent pregnancy.

6.6 Summary

In summary the factors affecting diet and nutrition during pregnancy, identified in the analysis of the focus groups and individual semi-structured interview are given below (See fig 16).

Fig.16 Factors affecting food choice during pregnancy.

Focus Groups
Pregnancy immobility
Mothers needs are last priority
Cultural fluidity
Advice alone can be ineffective
Pregnancy ailments
Sources of advice and support
Unrestrained from cultural norms to be thin

Individual Semi-Structured Interviews
Social facilitation
A lack of kinship
Positive encouragement offered by nurturing kin
When parenting begins
Freedom from constraints
Cultural norm
Knowledge
Body image (lack of)
Biology of pregnancy
Motivation
Sources of advice and support
Previous experiences

This analysis found that that the factors affecting food choice during pregnancy are driven by both internal and external factors equally (56). In this analysis many of the internal factors affecting food choice were related to the biology of pregnancy whether

it be immobility, ailments or pregnancy related nausea. Motivation is another internal factor affecting food choice and while individuals become motivated to change their diet for many reasons the only motivation factor for the women during pregnancy was for the health of their infant. Other motivational factors normally found in society such as the desire to be slimmer did not relate to the mothers in this analysis. In fact for the mothers body image was not important during pregnancy. Most of the factors affecting food choice apart from those related to biology during pregnancy are underpinned by social and cultural norms either by breaking away from them during pregnancy identified in 'Freedom from constraints' and 'Unrestrained from cultural norms to be thin' or by actively enforcing the cultural norm even when advice or beliefs may indicated otherwise, identified when a mother continued to consume her curries against her belief that they were not that healthy during pregnancy. Many of the factors identified in this study are centred on the advice and the amount of support that the women had around them, with the 'Positive influence of nurturing kin' and the actual sources of advice influencing food choice. A lack of kinship similarly affected food choice with hassle free snack food being consumed by some of the mothers who felt lonely, isolated and demotivated (67). Family hierarchy and roles also contributed to the factors which affect food choice, with the 'mothers putting their needs as the last priority' for food choice being the most pronounced.

CHAPTER 7

DISCUSSION

7.1 Overview of the chapter

This thesis will conclude by revisiting the aims of this study and will discuss the collaborations, limitations and strengths of the methods and analysis. The main findings of this study with be discussed with reference to the current literature and a description of future work will be given. This chapter will finish with a brief conclusion.

7.2 Aim 1: Dietary intakes, supplement use and birth outcomes

This thesis aimed to assess the relationship between nutritional intakes from the diet and supplements with birth outcomes in Caucasian and South Asian women living in the UK.

7.2.1 Collaborations

The collaboration between the UR project and the BiB project allowed this study to access a large cohort of women living in the UK, and because of the ethnic diversity of the city of Bradford where the BiB project was collecting its data; a relatively equal amount of women of both South Asian and Caucasian ethnicity could be recruited. The collaboration between the UR and the BIB project meant that this study could obtain data about supplement use during the 2nd trimester of pregnancy and birth outcomes.

A second collaboration with a project assessing vitamin D intake and bone health allowed this project to access a group of South Asian women living in the North West of England. Collecting this diet data has helped this study to comment on the dietary nutritional intakes of South Asian women.

7.2.2 Limitations of the methods and analysis

Unfortunately due to the time that the 'Mothers baseline questionnaire' took to administer during the 2h GTT, there was no longer the opportunity to collect dietary intake data. To assess the dietary nutrient intakes of South Asian women, non-pregnant non-breastfeeding women were recruited from a medical practice in Blackburn UK. These women completed a 7 day diet diary. One of the limitations of this study was that dietary nutritional intakes could not be directly assessed with infant birth weight. Instead the dietary nutritional intakes of South Asian women could be assessed giving comment to adequacy in the peri-conceptual period.

Birth weight and supplement use data were analysed both by parametric and non-parametric tests and therefore different criteria were used to measure statistical significance. Pre-term and post-term birth weight and supplement use within each ethnicity were analysed using independent samples t-tests because the data was normally distributed, however term birth weight was not normally distributed and therefore a non-parametric Mann Whitney test was used. In an attempt to find a normal distribution within the data the mean was trimmed by 10% but this increased the significance of the data being not normally distributed therefore all the data sets have been included in the final analysis. There are two possible reasons for this. The first is that because of the sample size it is very easy to get a significant result from small deviations from normality and the second is that there is another population within the birth weight cohort. This second population such as a disproportionate number of highly educated women could be pulling the data in one direction or the other, however because such data was not collect by this study the reason for the not normally distributed data is unknown.

Some caution must be considered when reporting the significant association between term birth weight and iron supplement use in South Asian mothers because other confounding factors such as age of the mother and maternal pre-pregnancy body weight have not been included in the analysis which would have an affect on birth weight. Also when running many statistical tests, it is likely that one test would yield a significant result purely by chance which is what may have happened the one significant result within the term gestation infants birth weight and pre natal iron supplementation in South Asian women. Some caution should also be considered when stating that there is an association between supplement use and birth weight. Firstly the dose of the nutritional supplement was not collected and the frequency that the supplement was taken was not analysed and so it is difficult to determine the difference between a women taking a very low dose once a week and a women taking a higher dose every day and therefore the evidence that there is an association between the supplement use and birth weight is not very concise and clear. Secondly the questionnaire did not collect data about when the women first started supplementing their diet during pregnancy which may have altered the birth weight of the infant. For instance supplementation throughout pregnancy may have more of an affect on birth weight than only taking it for a small period of the pregnancy. Thirdly to tease out a true association between supplement use during pregnancy and infant birth weight, other dietary factors such as the amount of a nutrient taken in by the diet alone need to be determined so to not confuse the effect of the nutrient from the diet with the affect of the nutrient of from the supplement. However if an in-depth study was to be undertaken to assess the affect of supplement use on birth weight it was also be wise to consider the absorption of a nutrient and to measure the biomarkers of the nutrient to gain a more accurate effect model on birth weight.

7.2.3 Strengths of the methods and the analysis

A strength of the supplement use and birth outcome data is the size of the cohort. In collaboration with the UR and the BiB projects this study was able to access 1162 sets of supplement use and birth outcome data and in collaboration with the Vitamin D and bone healthy study 15 diet diaries were also collected and analysed for this study.

7.2.4 Results and the literature

This study found that term birth weight was significantly ($P<0.001$) higher in Caucasian than South Asian infants in Bradford in line with current literature (1, 7) and that supplement use was significantly ($P<0.001$) more prevalent in South Asian women than Caucasian women. Iron and folic acid supplementation was taken by more South Asian women while multivitamins were taken by more Caucasian women during 22-28 weeks of gestation. The only dietary supplement that could be associated with term birth weight was for iron supplementation and this was only between South Asian women who did and did not take iron supplements. The reason why iron supplementation may be associated with increased birth weight for South Asian infants is unclear but there are several factors which should be explored. Data on whether the iron supplements were taken as a choice made by the mother or whether the iron supplements were prescribed following a diagnosis of anaemia, was not collected and remains unclear. However it should be mentioned that IDA (Hb ≤12mg/l) in South Asian women is approximately 3 times more prevalent than in European women in the UK (93). This could account for the higher rates of iron supplements use by the South Asian women in my study and for the mean lower birth weights in the South Asian group as a whole (26).

Fischbacher et al (93) concluded in his study that IDA tended to be more common in those who rarely or never ate meat. The dietary nutrient intakes of South Asian women

of child bearing age in my study revealed that only 68% of the RNI for iron intake was met, and it could be speculated that iron stores would be low and that there would be a high possibility of IDA cases in this group and also in the iron supplemented South Asian women. Iron deficiency anaemia in pregnant women in the UK is treated with iron supplementation. A recent review assessing the treatments for IDA in pregnancy concluded that daily oral iron treatment improves haematological indices in pregnant women but that this did not translate into clinical improvements (including LBW) for their offspring (94). This review included 17 studies in the review but found that the studies were small and generally had poor methodology and therefore outcomes should be accepted cautiously. A separate review of preventative iron supplementation during pregnancy also found that daily oral iron supplementation increased Hb during pregnancy and reduced the risk of anaemia at gestational term but that no significant reduction of incidences of LWB were detected. It was also suggested that daily iron supplementation can also increase the risk of haemoconcentration during the 2nd and 3rd trimesters but that the significance of haemoconcentration remains uncertain (95). Separate studies have associated haemoconcentration with SGA infants with placental infarction being suggested as a possible cause (96).

As there is little evidence from systematic reviews to suggest that iron supplementation in anaemic and non-anaemic pregnant women improves birth weight, it could be suggested that South Asian women in this study may have a poor iron status which would explain in part the reduced term birth weights observed. A review by Scholl (2005) suggested that IDA in the 1st and 2nd trimesters of pregnancy can increase the risk of infant LBW (26) and this finding would fit with our dietary nutrient intake analysis that iron intakes in South Asian women are very low and therefore many South Asian women may enter pregnancy with a low iron status. It should also be mentioned

that if many non-anaemic South Asian women are attempting to prevent IDA during pregnancy by self-prescribing iron supplements, that haemoconcentration may interfere with the growth of their infant in-utero.

Although no association between improved birth weight and iron supplementation has been reported, this may be due to a lack of evidence rather than an actual causal non effect of iron supplementation and that pregnant anaemic women should still be treated with supplemented iron as prescribed for their own health and that of their unborn child.

The dietary vitamin C intakes of the South Asian women were very high and non-starch-polysaccharide intake was below average and below the RNI, together this would make the iron that the women consumed more bioavailable. High vitamin C intake in South Asian women has not been documented before. Many of the diet diaries reported, detailed home-made recipes for tomato based vegetable curries, it is possible that picture portion sizes may have been misleading as they were not specific to Asian foods. Some recent research has begun to produce a set of photograph food portion sizes specifically for South Asian foods to improve the estimation of food consumed (97).

As well as iron, calcium, iodine and selenium intakes were all below the RNI and dietary vitamin D did not meet the recommended dietary intake for pregnancy (23). A low dietary calcium and vitamin D intake and a low serum vitamin D status has previously been observed in South Asian women (98). It is therefore important that women of South Asian decent supplement their diet during pregnancy with 10µg/d (23), however this study found that less than 1% of South Asian and Caucasian women took vitamin D supplements during their second trimester of pregnancy and only 13% of South Asian women took a multivitamin probably containing vitamin D.

Further research into selenium, iodine, iron and vitamin D dietary and supplemented intakes and birth outcomes are required.

7.3 Aim 2: Social and cultural determinates of food choice during pregnancy for South Asian women

This thesis aimed to explore the social and cultural determinates of food choice during pregnancy for South Asian women.

7.3.1 Collaborations

The collaboration between the UR project and the BiB project allowed this study to access a large cohort of women living in the UK, and because of the ethnic diversity of the city Bradford where the BiB project was collecting its data, an equal amount of women of both South Asian and Caucasian ethnicity could be recruited. The collaboration between the UR and the BIB project meant that this study could obtain data about awareness of and compliance to the government 5 a day initiative and sources of nutritional advice for pregnant South Asian women.

A collaboration with the UR project also meant that two focus groups and seven individual semi structured interviews with South Asian women living in Bradford could be conducted.

7.3.2 Limitations of the methods and analysis

The focus groups and individual semi-structured interviews met the aim to explore the social and cultural determinates of food choice during pregnancy by drawing out emergent feelings, beliefs, experiences and perceptions of the mothers. However while the initial analysis of the focus group data gave a broad base of themes, the discussions that the women had were lacking detail and depth and therefore identifying the underlying causes and meanings of the emergent themes was difficult. Additionally because of the: low numbers of mothers attending the two focus groups, many topics covered during the two focus groups and evidence of both conformance and challenging of others ideas, it was also difficult to draw out themes which were not unique to an individual and therefore capable of generalisation (99). Compared to the individual semi-structured interviews, the focus groups yielded less data despite a very similar number of individual participants involved (99). The mothers attending the focus groups and individual interviews, were recruited from the community and were fairly homogenous and representative of the whole community in that they were all mothers of infants, all from South Asian descent and all lived in a similar area, some had part time work a few were on maternity leave from full time work and all but 1 were married. The only concern is that all of these mothers were already known to the SureStart centre and therefore were engaged within the community. Women who were not fully engaged in the community were probably under represented.

It is difficult to comment on the on the attendance of the focus group in relation to the amount of women approached. This is because members of the SureStart centre approached women in the centre and contacted women known to them but this data was not recorded. However the SureStart staff gave assurance that many more women were approached than attended and therefore based on the experience of this study over

recruitment is recommended. The second focus group with five participants was very manageable and discussion was more forthcoming than in the first focus group where there were only 3 main contributors to the session.

While the attendance of the infants in the group was necessary to encourage the mothers to attend the focus groups and individual semi-structured interviews and it was very important that the mothers were able to continue with the childcare and breastfeeding as they wished, it did create some distraction for the mothers and made hearing the conversations and transcribing the audio recording very difficult. While it would not be beneficial to exclude infants from the focus group and individual interviews sessions because of the attendance of the mothers and because of the care the infant requires from its mother, the practical set up of the sessions should be very carefully considered and planned to maximise the quality of data collected.

It is also important to consider the characteristics and suitability of the facilitator for the particular cohort involved in the data collection sessions. While many of the strengths of the facilitator in this project are discussed in paragraph 7.3.3, some of the weaknesses and the impact this had on the data collection methods will be discussed here. The facilitator for this project had no experience of facilitating focus groups or conducting semi-structured interviews when starting this project, however before the data collection sessions were held the facilitator did observe another focus group to gain some experience of how focus groups were run. The lack of experience of the facilitator may have contributed to less in depth stories being discussed during the focus groups, due to a lack of experience of questioning, leading, controlling and focusing the group discussion when needed. More in depth stories were discussed during the individual semi-structured interviews and this may not have only been because the discussions

were following on from themes identified by the initial analyses of the focus groups but may be because the inexperienced facilitator would have found it easier to focus on one women and had by then gained more experience in questioning.

The facilitator in this project did not have any children of her own which probably provided both benefits and limitations when facilitating the sessions. Not being a mother herself may have meant that the facilitator may have lacked some understanding of the difficulties and emotions involved with pregnancy and parenting and therefore opportunities for further questioning may have been missed. The benefit of not having children of her own will be discussed in paragraph 7.3.3. The facilitator was also of White ethnicity unlike the South Asian participants which may also have had advantages and disadvantages when collecting the qualitative data. Being of a different ethnic background to the participants, the facilitator may have missed some valuable opportunities for further questioning due to a lack of understanding and depth of knowledge of the South Asian cultural norms. It is difficult to discuss to what extent not being a mother or of South Asian decent affected the data collection or analysis because the facilitator felt that she mainly understood what was being discussed or asked for more clarification if she did not. Not speaking Urdu and Punjabi was more of a problem because the facilitator had to rely on a translator during the focus group sessions.

A limitation of the methods of data collection was the ineffectiveness of the translation for the participant who spoke limited English in focus group 1. This study did not want to exclude any mothers from the South Asian community who did not speak English due to the rich data that would be gathered, however including a translator into the session was not as effective as hoped and did affect the group dynamics (100) and the flow of the discussion. The translator was not a professional and therefore did not

involve the mother in a lot of the discussion and she was also not very competent at reporting back what the mother was saying which made it more difficult to engage the mother further. A trained translator would have been more productive.

A limitation of the data collected for the compliance to the 5 a day government initiative was that the question was not designed to collect a quantitative frequency of compliance. The question required only an always, sometimes or never answer. It would have been more informative to ask for a frequency of compliance such a 0 days, 1-2, 3-5, 5-6 days or everyday answer. A question designed in this way would enable us to explore further the sometimes option for the data collected in this project. It would have been beneficial to have piloted the awareness and compliance to the 5 a day initiative and the sources of information for the pregnant women questions.

7.3.3 Strengths of the methods and the analysis

Collecting data by individual semi-structured interviews following the initial analysis of the two focus groups allowed much more detail of the mothers' experiences to be captured. The initial focus group analyses provided initial themes of the mothers experiences, expectations and roles, however it was felt that often the focus group conversations moved on too quickly and the details of the conversations were lacking possibly due to the inexperience of the facilitator as previously discussed in paragraph 7.3.2. The interviews were designed to further explore the themes identified in the focus group analysis and to capture experiences where it was thought that there were holes in the data. The interviewing of the mothers individually was effective at focusing and exploring their experiences in more detail.

One of the problems that can occur when conducting focus groups and semi-structured interviews that must to be overcome to collect worthwhile data, is that the participants can be inhibited by the perceived power of the facilitator. In this project however the facilitator was a similar age to the participants and did not have a traditional profession such as a doctor, nurse or teacher and as such was fairly equal to the participants. The facilitator was not the same ethnicity as the women or from the local area and this was of benefit to these sessions, in particular the individual interviews, where the women felt very secure due to the private nature of the interview and un-judged by a person from outside their own community to be able to talk openly, honestly and in complete confidence. Because the facilitator had no children of her own this acted in favour of collecting data because the participants were now in a position of power and were enthusiastic to pass on their knowledge and experiences to somebody who had who had no experience of pregnancy, childbirth and parenting. The women may have also felt less judged than they may have done by another mother and therefore were more able to be open and honest about their experiences.

The numbers of the data sets collected for the awareness of and compliance to the government 5 a day initiative and sources of advice during pregnancy is a strength for this type of quantitative data.

7.3.4 Results and the literature

For the awareness of the government 5 a day initiative, 99% and 97% of Caucasian and South Asian responders respectively reported being aware of the initiative and 95% of interview conducted in a language other than English also reported being aware. This along with over three quarters of the respondents reporting that the sometimes ate 5

portion per day. This is encouraging for the initiative, not only because almost everybody is aware of it but because a good majority of people are making some attempt to achieve this. A final report by the Big Lottery Fund (2006) which funded a project to target 66 areas of the UK to address local barriers to the initiative, found that awareness of the initiative and its guideline had improved and fruit and vegetable consumption had marginally improved (101).

The two most popular sources of nutritional advice during pregnancy were midwives/health visitors and family members for both Caucasian and South Asian women. This finding was consistent with the findings from the focus groups and individual semi-structured interviews where support and advice from health care professionals were identified as well as from the informal social networks being mainly family members.

The analysis of the focus groups and the individual semi-structured interviews found eighteen factors which affected food choice for pregnant South Asian women. Many of the factors identified were centred around the support networks available to the mothers. The support networks could affect food choice for the mothers by family members offering the mother food when she was tired which was consistent with finding in a Mexican American cohort where the paternal grandmother would ensure that the mother ate healthy foods (66). The mothers partner also offered support and advice which is consistent with other findings in a Guatemalan cohort (102). The support networks were also a valuable source of advice for the mothers which affected food choice. The different sources of advice had their own agendas, wishes and knowledge and depending on these, the advice given to the mothers varied. The type of advice received from the family was much more based on the personal experiences of the grandmothers

and sisters which they passed onto the mother. The grandmothers and sisters previous knowledge of the mothers' values and experiences also meant that they were able to offer more personally tailored advice to the mothers during her pregnancy, while the advice from the health care professionals was more informational and generic. A similar finding has been observed by Clark et al when assessing the care of disabled people by family members and health care practitioners (103) as cited in (104). The mothers however did greatly value both sets of advice and did attribute their healthy pregnancies and infants to the professional care they received.

Other factors affecting food choice were determined by the biology of the mothers during pregnancy with pregnancy nausea and immobility influencing how they were able to shop for, prepare and cook and eat food. A recent study evaluating the nutritional status of pregnant women suffering from hyperemesis gravidarum with healthy pregnant controls found that mean dietary intake of most nutrients fell below 50% of the recommendation for the ill women (105), highlighting the influence that the biology of pregnancy can have on the mother.

Culture is defined as ''a set of guidelines which individuals inherit as particular members of a society, and which tells them how to view the world, how to experience it emotionally, and how to behave in it'' (106) as cited in (107). This study found that cultural norms can influence food choice with cultural fluidity being an example. The movement between Western and the South Asian culture has influenced the diet and food choices of the mothers and their families with both South Asian and Western food being eaten. During pregnancy this study found that the mothers both adhered to their own cultural norms and disregarded pregnancy advice and broke away from their pre-pregnancy social and cultural norms which in turn had an effect on their food choice. It

is possible that the acceptance and rejection of pre-pregnancy social and cultural norms is because the women are following a different set of pregnancy social and cultural norms.

Such pregnancy social and cultural norms for South Asian women require further investigation and the literature on this subject is limited.

7.4 Further work

Selenium intake in the South Asian diet was below the RNI and as intake is thought to be declining in the UK and because there are too few studies reporting the consequences of a low dietary intake in relation to adverse birth outcomes such as pre-term birth and birth weight, more studies are required.

Iodine deficiencies have also recently been identified in teen age girls in the UK with around two thirds of girls reportedly having a deficiency (78). The South Asian women in this study had a dietary intake of iodine of 113µg/d which is below the RNI. As the effect of iodine deficiency on pregnancy outcomes is severe with the problems in neurodevelopment, stillbirth and foetal loss being reported further investigation into the iodine status and dietary components of iodine in South Asian women needs to be explored.

Iron intakes were also below the RNI for the South Asian women and because of the high incidence of anaemia and iron supplement use in pregnant South Asian women various factors surrounding iron deficiency, iron intakes, supplement use and the

interactions of iron status, supplement use and adverse birth outcomes need to be explored.

Vitamin D and calcium intakes were also below the UK national average and below the RNI for pregnancy, in the South Asian diet. More health promotion work may need to be considered to increase the awareness of the importance of vitamin D supplementation during pregnancy (as recommended), as <15% of South Asian women took multivitamin and mineral supplements in this study.

Modern pregnancy social and cultural norms such as dressing attractively, the desire to obtain a pre-pregnancy body quickly and increased knowledge making alcohol consumption, smoking and eating certain foods socially unacceptable in society have been documented in a Caucasian cohort (108). The social and cultural norms of South Asian women during pregnancy in the 21st century in the UK warrants further investigation.

7.5 Conclusion

In conclusion, the diet of South Asian women was adequate for vitamin A, B and C and zinc. Of these vitamins and minerals only folate intake was inadequate to meet the dietary requirements in the peri-conceptual period. Calcium, iron, selenium and iodine were below the recommended RNI for women and therefore are also inadequate should the women become pregnant.

Vitamin D is the only recommended vitamin to be taken during the second trimester of pregnancy and this study found that 23% of Caucasian and 13% South Asian mothers took vitamin D or a multivitamin contain vitamin D during their second trimester of pregnancy. Iron supplement use was considerably higher in South Asian than Caucasian women and the reason for this was not identified in this study. Iron supplementation however was the only supplement which could be associated with term birth weight with infants born to South Asian mothers who took iron supplements during pregnancy being significantly heavier than South Asian mother who did not. This would suggest that overall dietary supplements alone cannot improve infant birth weight or the incidence of LBW infants in South Asian women, with the possible exception of iron.

Women from both the Caucasian and the South Asian populations were aware of the 5 a day recommendations and three quarters of the cohort reported to sometimes consuming the recommended amount of fruit and vegetables in one day, which is encouraging.

The two main sources of nutritional advice for both Caucasian and South Asian women are firstly midwives/health visitors and secondly family members. The focus group and individual semi-structured interviews analyses also found that the informal support networks and professional support and advice was important to the mothers and did help the mothers to eat well during pregnancy. The mothers own biology during pregnancy and social and cultural norms were also found to influence food choice for the mothers during pregnancy.

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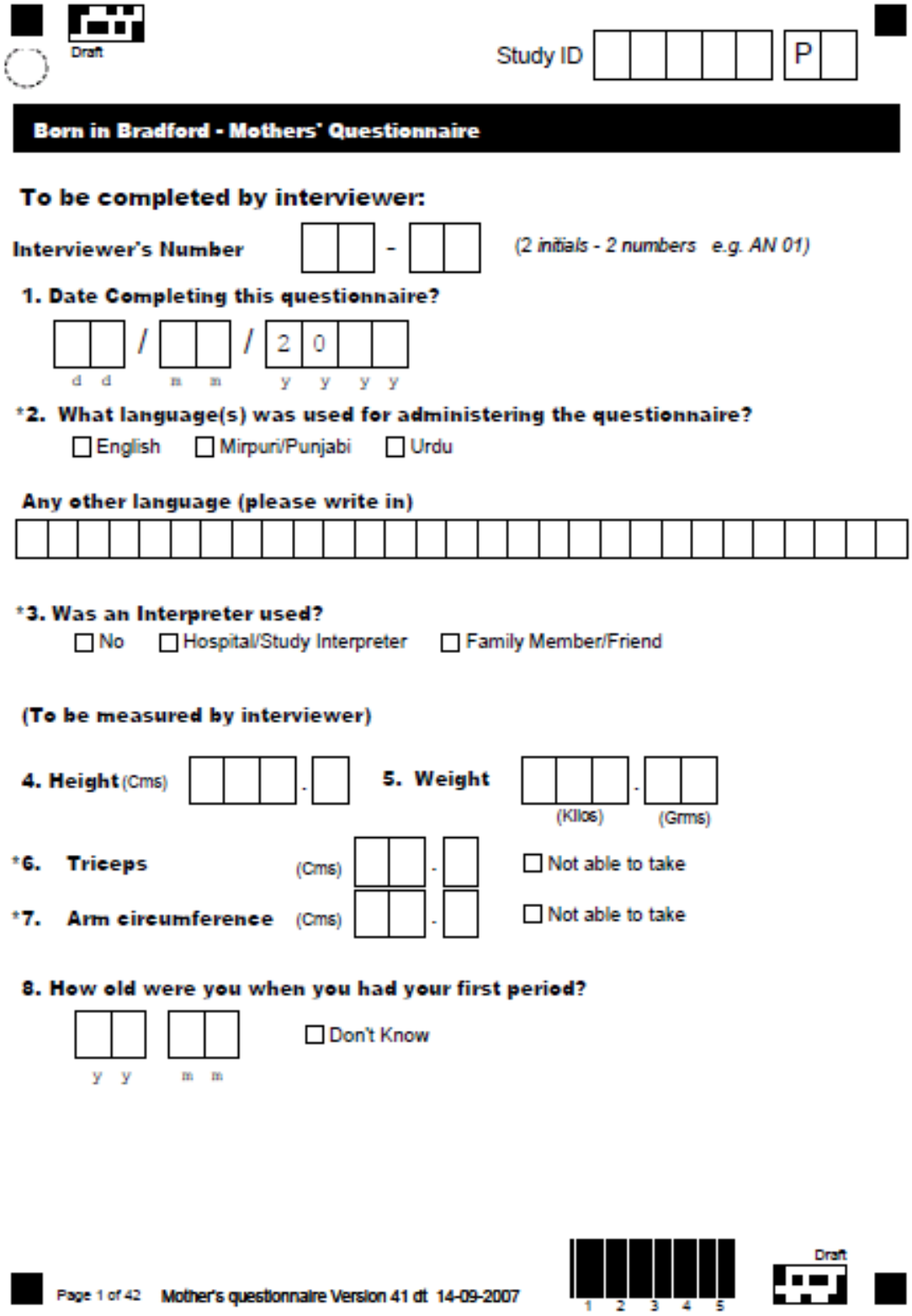
APPENDICES

Appendix 1. The BiB mothers' baseline questionnaire.



Draft

Study ID P

Born in Bradford - Mothers' Questionnaire

To be completed by interviewer:

Interviewer's Number – *(2 initials - 2 numbers e.g. AN 01)*

1. Date Completing this questionnaire?

d d / m m / 2 0 y y

***2. What language(s) was used for administering the questionnaire?**

☐ English ☐ Mirpuri/Punjabi ☐ Urdu

Any other language (please write in)

***3. Was an Interpreter used?**

☐ No ☐ Hospital/Study Interpreter ☐ Family Member/Friend

(To be measured by interviewer)

4. Height (Cms) . **5. Weight** (Kilos) . (Grms)

***6. Triceps** (Cms) . ☐ Not able to take

***7. Arm circumference** (Cms) . ☐ Not able to take

8. How old were you when you had your first period?

y y m m ☐ Don't Know

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Draft

9. Will this be your first child? ☐ Yes ☐ No

9a) If no:- what month and year were each of your previous children born in ?
- starting with the eldest:

	Month	Year
First child		
Second child		
Third child		
Fourth child		
Fifth child		
(add birth dates of all other children)		

Section A - Where you live

These questions relate to where you are living at present.

***A1. How long have you lived at your current address?** y y m m

***A2. In which of these ways does your household occupy this address?**
(Cross ONE box ONLY)

If answers yes to any of the three * questions, please go to A2a). If not go to A3

- ☐ Buying it with the help of a mortgage or loan
- ☐ Owns outright
- ☐ *Rents it
- ☐ *Lives here rent free (including rent free in relatives/friends property excluding squatting)
- ☐ *Pays part rent and part mortgage (shared ownership)
- ☐ Don't know
- ☐ Squatting

***A2a) If A2 was answered - Rents it: Lives rent free or pays part rent and part mortgage - ask who is your landlord?**
(Cross ONE box ONLY)

- ☐ Private Landlord or Letting Agency, Another individual
- ☐ Housing Association, Housing Co-operative, Charitable Trust
- ☐ Local Authority/Council
- ☐ Relative or friend (before you lived here) of a household member
- ☐ Employer (individual) of a household member
- ☐ Employer (organisation) of a household member
- ☐ Another Organisation
- ☐ Don't Know

A3) How many bedrooms does your household have, including bedsitting rooms and spare bedrooms?

Enter number of bedrooms ☐☐

Section B - Who you live with?

B1. What ages are those, including yourself, who live in your household or accommodation? [If age not known, please give best estimate]

Is there anybody:-

Age	Number of males	Number of females
Under 2 years		
between 2 -15 years		
between 16 - 17 years		
between 18 - 64 years		
65 years and over		

B2. Are you: (Cross ONE box ONLY)

- ☐ Married (first marriage)
- ☐ Re-married
- ☐ Single (never married)
- ☐ Separated (but still legally married)
- ☐ Divorced
- ☐ Widowed

B3. Are you: (Cross ONE box ONLY)

- ☐ Living with baby's father
- ☐ Living with another partner
- ☐ Not living with a partner – but in a relationship (eg. partner living abroad or in another propery)
- ☐ Not living with a partner and not in a relationship

Draft

Section C - About you, your family and your baby's father and his family

C1. What country were you and your baby's father born in?

(Cross ONE box ONLY in each column).

Country	You	Country	Baby's father
England	☐	England	☐
Northern Ireland	☐	Northern Ireland	☐
Scotland	☐	Scotland	☐
Wales	☐	Wales	☐
Channel Islands	☐	Channel Islands	☐
Isle of Man	☐	Isle of Man	☐
Republic of Ireland	☐	Republic of Ireland	☐
Czech Republic	☐	Czech Republic	☐
Poland	☐	Poland	☐
Slovakia	☐	Slovakia	☐
Bangladesh	☐	Bangladesh	☐
India	☐	India	☐
Pakistan	☐	Pakistan	☐
Sri Lanka	☐	Sri Lanka	☐
Philippines	☐	Philippines	☐
Don't know	☐	Don't know	☐

You - Other (Please write in)

Baby's father - Other (Please write in)

Draft

***C2. To be asked if not born in the UK**
How old were you when you moved to the UK?

Age in Years ☐☐ ☐☐
y y m m

If answered Pakistan for you and/or baby's father in C1 go to C3.
If not Pakistan for either person then go to C4.

C3) Were you and/or baby's father born in Mirpur District?
(Cross ONE box ONLY in each row)

You	☐ Yes	☐ No	☐ Don't Know
Baby's father	☐ Yes	☐ No	☐ Don't Know

***C3a) If yes, which town or village?**

You (Please write in) ☐ Don't Know

Baby's father (Please write in) ☐ Don't Know

***C3b) Do you know the name of your's and baby's father's Biraderi?**
(Interviewer - consult list of Biraderi if necessary).

You (Please write in) ☐ Don't Know

Baby's father (Please write in) ☐ Don't Know

Draft

***C4. What country were your mother and father born in?**
(Cross ONE box ONLY in each column).

Country	Your Mother	Country	Your Father
England	☐	England	☐
Northern Ireland	☐	Northern Ireland	☐
Scotland	☐	Scotland	☐
Wales	☐	Wales	☐
Channel Islands	☐	Channel Islands	☐
Isle of Man	☐	Isle of Man	☐
Republic of Ireland	☐	Republic of Ireland	☐
Czech Republic	☐	Czech Republic	☐
Poland	☐	Poland	☐
Slovakia	☐	Slovakia	☐
Bangladesh	☐	Bangladesh	☐
India	☐	India	☐
Pakistan	☐	Pakistan	☐
Sri Lanka	☐	Sri Lanka	☐
Philippines	☐	Philippines	☐
Don't know	☐	Don't know	☐

Your mother - Other (Please write in)

Your father - Other (Please write in)

If answered Pakistan for your mother or father in C4 go to C5 if not Pakistan then go to C6

C5) Were your mother and father born in Mirpur district?
(Cross ONE box ONLY)

Your mother	☐ Yes	☐ No	☐ Don't Know
Your father	☐ Yes	☐ No	☐ Don't Know

Draft

C5a) If yes, which town or village?

Your mother - (Please write in) ☐ Don't Know

Your father - (Please write in) ☐ Don't Know

C5b) Do you know the name of your mother's and father's Biraderi?

Your mother - (Please write in) ☐ Don't Know

Your father - (Please write in) ☐ Don't Know

C6 What country were your grandparents born in?

(Cross ONE box ONLY in each column).

Country	Your mother's mother	Your mother's father	Your father's mother	Your father's father
England	☐	☐	☐	☐
Northern Ireland	☐	☐	☐	☐
Scotland	☐	☐	☐	☐
Wales	☐	☐	☐	☐
Channel Islands	☐	☐	☐	☐
Isle of Man	☐	☐	☐	☐
Republic of Ireland	☐	☐	☐	☐
Czech Republic	☐	☐	☐	☐
Poland	☐	☐	☐	☐
Slovakia	☐	☐	☐	☐
Bangladesh	☐	☐	☐	☐
India	☐	☐	☐	☐
Pakistan	☐	☐	☐	☐
Sri Lanka	☐	☐	☐	☐
Philippines	☐	☐	☐	☐
Don't know	☐	☐	☐	☐

Your mother's mother - Other (Please write in)

Your mother's father - Other (Please write

Your father's mother - Other (Please write in)

Your father's father - Other (Please write in)

If answered Pakistan in C6 for where any of your grandparents were born ask C7:
If not go to C8.

Answer this if your grandparents were born in Pakistan If not go to C8.

C7. Were your grandparents born in Mirpur district? (Cross ONE box ONLY in each row)

Your mothers mother	☐ Yes	☐ No	☐ Don't Know
Your mother's father	☐ Yes	☐ No	☐ Don't Know
Your father's mother	☐ Yes	☐ No	☐ Don't Know
Your father's father	☐ Yes	☐ No	☐ Don't Know

C7a) If yes, which town or village ?

Your mother's mother - (Please write in) ☐ Don't Know

Your mother's father - (Please write in) ☐ Don't Know

Your father's mother - (Please write in) ☐ Don't Know

Your father's father - (Please write in) ☐ Don't Know

C7b) Do you know the name of your grandparent's Biraderies?

Your mothers mother - (Please write in) ☐ Don't Know

Your mothers father - (Please write in) ☐ Don't Know

Your fathers mother - (Please write in) ☐ Don't Know

Your fathers father - (Please write in) ☐ Don't Know

Draft

C8. What country were the parents of your baby's father born in?

(Cross ONE box ONLY in each column).

Country	Mother of baby's father	Country	Father of baby's father
England	☐	England	☐
Northern Ireland	☐	Northern Ireland	☐
Scotland	☐	Scotland	☐
Wales	☐	Wales	☐
Channel Islands	☐	Channel Islands	☐
Isle of Man	☐	Isle of Man	☐
Republic of Ireland	☐	Republic of Ireland	☐
Czech Republic	☐	Czech Republic	☐
Poland	☐	Poland	☐
Slovakia	☐	Slovakia	☐
Bangladesh	☐	Bangladesh	☐
India	☐	India	☐
Pakistan	☐	Pakistan	☐
Sri Lanka	☐	Sri Lanka	☐
Philippines	☐	Philippines	☐
Don't know	☐	Don't know	☐

Mother of baby's father - Other (Please write in)

Father of baby's father - Other (Please write in)

Draft

If answered Pakistan in C8 for where the mother of the baby's father or father of the baby's father was born ask C9: If not then go to C10.

Answer this if the mother of the baby's father or father of the baby's father was born in Pakistan

C9. Was the mother of the baby's father / father of the baby's father born in Mirpur ? (Cross ONE box ONLY in each row)

Mother of baby's father	☐ Yes	☐ No	☐ Don't Know
Father of baby's father	☐ Yes	☐ No	☐ Don't Know

C9a) If yes, which town or village ?

Mother of baby's father - (Please write in) ☐ Don't Know

Father of baby's father - (Please write in) ☐ Don't Know

C9b) Do you know the name of your baby's father's parents' Biraderies?

Mother of baby's father - (Please write in) ☐ Don't Know

Father of baby's father - (Please write in) ☐ Don't Know

Returning to you;

C10. To which of these groups do you consider you belong? (Cross ONE box ONLY)

☐ White	☐ Asian or Asian British
☐ Mixed ethnic group	☐ Chinese
☐ Black or Black British	☐ Other

C10a) If Answered C10 as White what do you consider your cultural background? (Cross ONE box ONLY)

☐ British ☐ Irish

Any other white background (please write in)

Draft

C10b) If Answered C10 as Mixed ethnic group what do you consider your cultural background? (Cross ONE box ONLY)

- ☐ White and Black Caribbean
- ☐ White and Black African
- ☐ White and Indian
- ☐ White and Pakistani
- ☐ White and Bangladeshi
- ☐ White and Indian Caribbean
- ☐ White and African-Indian

Any other mixed background (please write in)

C10c) If answered C10 as Black or Black British what do you consider your cultural background? (Cross ONE box ONLY)

- ☐ Caribbean
- ☐ African

Any other Black background (please write in)

C10d) If answered C10 as Asian or Asian British what do you consider your cultural background? (Cross ONE box ONLY)

- ☐ Indian
- ☐ Pakistani
- ☐ Bangladeshi
- ☐ Indian Caribbean
- ☐ African-Indian

Any other Asian background (please write in)

C10e) If answered C10 as Chinese what do you consider your cultural background? (Cross ONE box ONLY)

- ☐ Chinese
- ☐ Japanese
- ☐ Filipino
- ☐ Vietnamese

Any Chinese or other background (please write in)

C10f) If answered C10 as Other what do you consider your cultural background? (please write in)

Draft

Section D - Your Family

These questions are about you and your family and about baby's father and his family.

D1. Are you related to the father of your baby other than by marriage? For example are you cousins? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know

D1a) If yes, how are you related to the father of your baby? e.g. 1st cousin, 2nd cousin (Cross ONE box ONLY)

☐ 1st Cousin
☐ 1st Cousin, once removed
☐ Second Cousin
☐ Other related by blood
☐ Other related by marriage
☐ Don't know

D2. Were your parents related? For example were they cousins? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know

D2a) If yes, how were your parents related? (Cross ONE box ONLY)

☐ 1st Cousins
☐ 1st Cousins, once removed
☐ Second Cousins
☐ Other related by blood
☐ Other related by marriage
☐ Don't know

D3. Were the parents of the father of your baby related? For example were they cousins? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know

D3a) If yes, how were they related? (Cross ONE box ONLY)

☐ 1st Cousins
☐ 1st Cousins, once removed
☐ Second Cousins
☐ Other related by blood
☐ Other related by marriage
☐ Don't know

Interviewer: If answered yes in D1, please complete a family tree (on a separate form after you have completed this section. Do not change questions D1 to D3 after the family tree is completed).

D4. Was a family tree completed? ☐ Yes ☐ No

Draft

Section E Education

E1. What is the highest educational qualification you have? (Cross ONE box ONLY)

- ☐ 1 + 0 levels/CSEs/GCEs (any grades)
- ☐ 5 + 0 levels, 5+ CSEs (grade 1) 5 + GCSEs (grades A-C), School Certificate
- ☐ 1 + A levels/AS levels
- ☐ 2 + A levels, 4 + AS levels, Higher School Certificate
- ☐ NVQ Level 1, Foundation GNVQ
- ☐ NVQ Level 2,Intermediate GNVQ
- ☐ NVQ Level 3, Advanced GNVQ
- ☐ NVQ Levels 4-5, HNC, HND
- ☐ First Degree (e.g. BA, BSc)
- ☐ Higher Degree (e.g. MA, PhD, PGCE Post-graduate certificates/diplomas)
- ☐ Other qualifications (e.g. City and Guilds, RSA/OCR, BTEC/Edexcel)
- ☐ Overseas qualification *(If obtained in Pakistan go to E1a, If obtained in another country go to E1b)*
- ☐ No Qualifications
- ☐ Don't know

E1a) If your highest educational qualification was obtained in Pakistan please indicate: (Cross ONE box ONLY)

- ☐ Second School Certificate (SSC) Matriculation (Metric)
- ☐ Diploma in Commerce
- ☐ Higher Secondary (HSC) Cert/Intermediate Humanities, Pre-Eng or Pre-Medical/Science Streams
- ☐ Certificate from Board of Technical Education
- ☐ Diploma from Board of Technical Education
- ☐ Final Apprenticeship Certificate/Grade 2 Skilled
- ☐ Vocational Institute Diploma/Grade 3 Skilled Worker Certificate
- ☐ Batchelor Degree (4 year) in generally professional fields (excluding Bachelor of Education)
- ☐ Batchelor of Arts/Commerce/Engineering/Science/Technology (Pass and Honours)
- ☐ Postgraduate Eg Masters degree/PhD
- ☐ Don't know

Draft

E1b) If your highest educational qualification was not obtained in the UK or in Pakistan, please specify what that qualification was and which country it was obtained in.

Qualification

Country

E2. What is baby's father's highest educational qualification? (Cross ONE box ONLY)

- ☐ 1 + 0 levels/CSEs/GCEs (any grades)
- ☐ 5 + 0 levels, 5+ CSEs (grade 1) 5 + GCSEs (grades A-C), School Certificate
- ☐ 1 + A levels/AS levels
- ☐ 2 + A levels, 4 + AS levels, Higher School Certificate
- ☐ NVQ Level 1, Foundation GNVQ
- ☐ NVQ Level 2,Intermediate GNVQ
- ☐ NVQ Level 3, Advanced GNVQ
- ☐ NVQ Levels 4-5, HNC, HND
- ☐ First Degree (e.g. BA, BSc)
- ☐ Higher Degree (e.g. MA, PhD, PGCE Post-graduate certificates/diplomas)
- ☐ Other qualifications (e.g. City and Guilds, RSA/OCR, BTEC/Edexcel)
- ☐ Overseas qualification *(If obtained in Pakistan go to E2a, If obtained in another country go to E2b)*
- ☐ No Qualifications
- ☐ Don't know

Draft

E2a) If his highest educational qualification was obtained in Pakistan please indicate (Cross ONE box ONLY)

- ☐ Second School Certificate (SSC) Matriculation (Metric)
- ☐ Diploma in Commerce
- ☐ Higher Secondary (HSC) Cert/Intermediate Humanities, Pre-Eng or Pre-Medical/Science Streams
- ☐ Certificate from Board of Technical Education
- ☐ Diploma from Board of Technical Education
- ☐ Final Apprenticeship Certificate/Grade 2 Skilled
- ☐ Vocational Institute Diploma/Grade 3 Skilled Worker Certificate
- ☐ Batchelor Degree (4 year) in generally professional fields (excluding Bachelor of Education)
- ☐ Batchelor of Arts/Commerce/Engineering/Science/Technology (Pass and Honours)
- ☐ Postgraduate Eg Masters degree/PhD
- ☐ Don't know

E2b) If his highest educational qualification was not obtained in the UK or Pakistan, please specify what the qualification was and which country it was obtained in.

Qualification

Country

Draft

Section F Your Current Employment

F1. Are you currently a full time student? ☐ Yes ☐ No

F2. Are you currently working? ☐ Yes ☐ No (If Yes, go to F3)

F2a) If No - Have you ever worked? ☐ Yes ☐ No (If No, go to F12)

F2b) If yes to F2a - how long ago did you stop working?

Years ☐☐ Months ☐☐

If stopped less than one month ago record weeks - (round up to nearest week) Weeks ☐☐

F3. Are you currently on Maternity/Sick Leave? ☐ Yes ☐ No

F4. Were/are you self employed? ☐ Yes ☐ No

F4a) If no to F4 - If an employee, what type of industry/company do/did you work for?

F5. What was/is your job title?

F5b) How many people work at the place that you usually work?

☐ 1-2 ☐ 3-24 ☐ 25-499 ☐ 500+ (Cross ONE box ONLY)

F5c) Are/were you a: (Cross ONE box ONLY)

☐ Manager ☐ Supervisor ☐ Other Employee

F6. Please list the 2 or 3 main tasks you perform/performed at work?

F7. How many hours do/did you work in a typical week?

Indicate number of hours ☐☐.☐

Only answer F8-F11 if currently working or stopped working less than one year ago.

F8. How long have/had you done this job?

Years ☐☐ Months ☐☐

F9. Where is/was your main place of work? (Cross ONE box ONLY)

☐ Work mainly at or from home ☐ No regular place of work

If neither of the above ask 10 and 10a. Everyone should be asked F11.

F10. What is/was your main place of work?

Street

Town

Postcode

F10a. How do/did you usually travel to work?

Cross ONE box ONLY indicating what is/was the longest part, by distance, of your usual journey to work.

☐ Work mainly at or from home
☐ Train
☐ Bus, minibus or coach
☐ Motor cycle, scooter or moped
☐ Driving a car or van
☐ Passenger in a car or van
☐ Taxi
☐ Bicycle
☐ On foot
☐ Other

Other - (please write in)

F11. How many days in a typical week do/did you go to work?

(Enter 0 if works mainly at or from home)

Days ☐☐

About baby's father

***F12. Which best describes the sort of work the baby's father does?**

If not in work now, please **cross ONE box ONLY** to show what work he did in his last main job.

- ☐ Modern professional occupations
- ☐ Clerical and intermediate occupations
- ☐ Senior managers or administrators
- ☐ Technical and craft occupations
- ☐ Semi-routine manual and service occupations
- ☐ Routine manual and service occupations
- ☐ Middle or junior managers
- ☐ Traditional professional occupations
- ☐ Self Employed
- ☐ Student/in training
- ☐ Does not work – long term unemployed/ill health (one year or over).
- ☐ Don't know

Draft

***F13. Can you tell me which of these credits/allowances/benefits you and your husband/partner receive?**

(Please cross ALL that apply)

- ☐ Child Benefit
- ☐ Child Tax Credit
- ☐ Working Tax Credit (Formerly Working Family Tax Credit and Disabled Person's Tax Credit)
- ☐ Income Support
- ☐ Disability Living Allowance (including Disabled Person's Tax Credit)
- ☐ Income tested Job Seekers Allowance (Unemployment)
- ☐ Housing Benefit/Rent Rebate/Council Tax Benefit
- ☐ Incapacity Benefit (Replaces Invalidity and NI Sickness Benefit)
- ☐ Pension Credit
- ☐ Carer's allowance (was Invalid Care Allowance)
- ☐ None
- ☐ Don't know
- ☐ Does not wish to answer

Any Other State Benefit Please specify below

Draft

***F14. This table shows income in weekly, monthly and annual amounts.**

Which of the amounts on this list represents you and your husband/partner's, total income from all jobs, (full and part time), all tax credits, all benefits and all other sources and earnings after tax when all income is added together. (Cross ONE box ONLY)

Weekly Income after Tax	Monthly Income after tax	Annual Income after Tax	
Less than £25	Less than £108	less than £1,299	☐
£25 - £39	£109 - £175	£1,300 - £2,099	☐
£40 - £59	£176 - £259	£2,100 - £3,099	☐
£60 - £79	£260 - £350	£3,100 - £4,199	☐
£80 - £99	£351 - £433	£4,200 - £5,199	☐
£100 - £124	£434 - £542	£5,200 - £6,499	☐
£125 - £149	£543 - £650	£6,500 - £7,799	☐
£150 - £179	£651 - £775	£7,800 - £9,299	☐
£180 - £209	£776 - £917	£9,300 - £10,999	☐
£210 - £259	£918 - £1,125	£11,000 - £13,499	☐
£260 - £299	£1,126 - £1,333	£13,500 - £15,999	☐
£300 - £379	£1,334 - £1,667	£16,000 - £19,999	☐
£380 - £479	£1,668 - £2,083	£20,000 - £24,999	☐
£480 - £577	£2,084 - £2,500	£25,000 – £29,999	☐
£578 - £769	£2,501 - £3,333	£30,000 - £39,999	☐
£770 - £962	£3,334 - £4,167	£40,000 - £49,999	☐
£963 - £1,154	£4,168 - £5,000	£50,000 - £59,999	☐
£1,155 - £1,346	£5,001 - £5,833	£60,000 - £69,999	☐
£1,347 - £1,538	£5,834 - £6,667	£70,000 - £79,999	☐
£1,539 or more	£6,668 or more	£80,000 or more	☐
Does not wish to answer ☐		Don't know	☐

Draft

The next few questions are about the sorts of things that some people have but which many people have difficulty finding the money for.

***F15. Do you or you and your husband/partner have?**
(Cross ONE box ONLY in each row)

	Yes	I/we would like this but can't afford it at this moment	I/we do not want/need this at the moment	Does not wish to answer	Don't know
a) A holiday from home for at least one week once a year (not including staying with relatives in their home)	☐	☐	☐	☐	☐
b) Friends or family who call for a drink or meal at your house at least once a month	☐	☐	☐	☐	☐
c) Two pairs of all weather shoes	☐	☐	☐	☐	☐
d) Enough money to keep your home in a decent state of decoration	☐	☐	☐	☐	☐
e) Household contents Insurance	☐	☐	☐	☐	☐
f) Money to make regular savings of £10 a month or more for rainy days or retirement	☐	☐	☐	☐	☐
g) Money to replace any worn out furniture	☐	☐	☐	☐	☐
h) Money to replace or repair major electrical goods such as a refrigerator or a washing machine when broken	☐	☐	☐	☐	☐
i) A small amount of money to spend each week on yourself (not on your family)	☐	☐	☐	☐	☐
j) A hobby or leisure activity	☐	☐	☐	☐	☐
k) In winter are you able to keep your home warm enough	☐	☐	☐	☐	☐

***F16. Sometimes people are not able to pay every bill when it falls due. May I ask, are you up to date with the bills on this list or are you behind with any of them?**

Interviewer: Show card with list of bills

F16a) Are you up to date with all these bills? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know ☐ Does not wish to answer

F16b) If no, which ones are you behind with? (Cross ALL that apply)

- ☐ Electricity Bill
- ☐ Gas
- ☐ Other fuel bills like coal or oil
- ☐ Council tax
- ☐ Insurance Policies
- ☐ Telephone Bill
- ☐ Television/video/DVD rental or hire purchase
- ☐ Other hire purchase payments
- ☐ Water rates

***F17. These questions apply if you have any children living in your household now.** (Cross ONE box ONLY in each row)

	Yes	Would like to have this but cannot afford this at the moment	Children do not want/need this at the moment	Does not apply
a) Are there enough bedrooms for every child of 10 or over of a different sex to have their own bedroom.	☐	☐	☐	☐

The following questions apply to your children living with you

b) Does your child/children have leisure equipment or a bicycle	☐	☐	☐	☐
c) Does your child/children have celebrations on special occasions such as birthdays, or religious festivals	☐	☐	☐	☐
d) Does your child/do your children go swimming at least once a month	☐	☐	☐	☐
e) Does your child/children do A hobby or leisure activity	☐	☐	☐	☐
f) Does your child/children have friends round for tea or a snack once a fortnight	☐	☐	☐	☐

F18. If you have any children age under 6 who are not in School

(Cross ONE box ONLY)

	Yes	Would like to have this but cannot afford this at the moment	Children do not want/need this at the moment	Does not apply
Does your child/children go to a toddler group/nursery/playgroup at least once a week	☐	☐	☐	☐

F19. If your child/children is/are over age 6 or in school.

(Cross ONE box ONLY)

	Yes	Would like to have this but cannot afford this at the moment	Children do not want/need this at the moment	Does not apply
Does your child/children go on school trips	☐	☐	☐	☐

F20. For children of all ages (Cross ONE box ONLY)

	Yes	No	Does not apply
Does your child/children have an outdoor space or facilities nearby where they can play safely	☐	☐	☐

F21. How well would you say you or you and your husband/partner are managing financially these days. Would you say you are? (Cross ONE box ONLY)

☐ Living comfortably
☐ Doing alright
☐ Just about getting by
☐ Finding it quite difficult
☐ Finding it very difficult
☐ Does not wish to answer

F22. Compared to a year ago, how would you say you and your husband/partner are doing financially now? (Cross ONE box ONLY)

☐ Better off
☐ Worse off
☐ About the same
☐ Does not wish to answer

Draft

Section G - Smoking/Alcohol/Drug Use

We apologise if any questions in this section cause offence - we are asking everyone the same questions but we realise some religions do not permit certain things.

SMOKING

G1. Have you ever regularly smoked cigarettes; that is at least one cigarette a day? (Cross ONE box ONLY)

☐ Yes for more than 1 year ☐ Yes for less than 1 year ☐ No

If NO, go to question G4

G1a) How old were you when you started smoking cigarettes?

Age: ☐☐ Years old ☐ Don't Remember

G2. Do you smoke cigarettes nowadays? ☐ Yes ☐ No (Cross ONE box ONLY)

G2a) If no, when did you stop smoking?

Age: ☐☐ Years old ☐ Don't Remember

G3. How many cigarettes do/did you smoke during pregnancy, or in the three months before pregnancy? (Cross ONE box ONLY in each row)

	None	1-5 a day	6-10 a day	11-20 a day	Over 20 a day
a) 3 months before	☐	☐	☐	☐	☐
b) First 3 months of pregnancy	☐	☐	☐	☐	☐
c) Since the beginning of 4th month	☐	☐	☐	☐	☐

G4. During pregnancy have you been exposed to other peoples' cigarette smoke at work or at home and if Yes, for how many hours per day approx? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Less than 1 hour per day/occasionally

If yes - Hours ☐☐

G5. Have you used any other tobacco products like Paan during pregnancy, or in the 3 months before pregnancy? Interviewer: please show list of possible products.
(Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know If No, Don't Know or you don't remember go to question G6

***G5a) If yes please identify which ones and how many you smoke/chew etc., (relevant to point in pregnancy)**

	Daily	Weekly	Monthly	Rarely	If 1+ per week, how many per week
3 Months before pregnancy					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
First 3 months of pregnancy					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
From beginning of 4th month to now					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

G6. Have you used any drugs like marijuana or ecstasy during pregnancy or in the three months before pregnancy? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know If No, Don't Know or you don't remember go to question G7

***G6a) If yes please identify which ones and how often you have taken them (relevant to point in pregnancy)**

	Daily	Weekly	Monthly	Rarely	If 1+ per week, how many per week
3 Months before pregnancy					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
First 3 months of pregnancy					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
From beginning of 4th month to now					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

ALCOHOL

G7. Did you drink any alcohol during your pregnancy or in the 3 months before? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Remember If NO or don't remember go to Section H

G7a) Did you drink any alcohol in the 3 months before pregnancy?
(Cross ONE box ONLY)

☐ Yes, Once per week or more ☐ Yes, occasionally ☐ No ☐ Don't remember

If NO or don't remember go to question G7d)

G7b) If once per week or more, what is the weekly average and maximum number of units in a week?

	Average number of units per week	Maximum units at one time
Beer/Lager		
Wine		
Spirits		
Other		
Don't remember	☐	☐

G7c) In the 3 months before pregnancy how often did you consume 5 or more units of alcohol on one occasion? (Cross ONE box ONLY)

☐ Everyday ☐ 1-3 times a month

☐ Nearly every day ☐ Rarely

☐ 1-4 times/week ☐ Never

G7d) Did you drink any alcohol in the first 3 months of pregnancy?
(Cross ONE box ONLY)

☐ Yes, Once per week or more ☐ Yes, occasionally ☐ No ☐ Don't remember

If NO or don't remember go to section G7g)

G7e) If once per week or more, what is the average and maximum number of units in a week?

	Average number of units per week	Maximum units at one time
Beer/Lager		
Wine		
Spirits		
Other		
Don't remember	☐	☐

G7f) In the first 3 months of pregnancy how often did you consume 5 or more units of alcohol on one occasion? (Cross ONE box ONLY)

- ☐ Every day or more often
- ☐ Nearly every day
- ☐ 1-4 times/week
- ☐ 1-3 times a month
- ☐ Rarely
- ☐ Never

G7g) Did you drink any alcohol from the beginning of the 4th month until now of your pregnancy? (Cross ONE box ONLY)

☐ Yes, Once per week or more ☐ Yes, occasionally ☐ No ☐ Don't remember

If NO or don't remember go to section H

G7h) If once per week or more, what is the average and maximum number of units in a week?

	Average number of units per week	Maximum units at one time
Beer/Lager	☐☐	☐☐
Wine	☐☐	☐☐
Spirits	☐☐	☐☐
Other	☐☐	☐☐
Don't remember	☐	☐

G7i) Since the beginning of the 4th month of your pregnancy how often did you consume 5 or more units of alcohol on one occasion?
(Cross ONE box ONLY)

- ☐ Every day or more often
- ☐ Nearly every day
- ☐ 1-4 times/week
- ☐ 1-3 times a month
- ☐ Rarely
- ☐ Never

BREADS AND BREAD PRODUCTS

H1. During the last 4 weeks, on average how many slices/pieces of the following did you eat per week?

	Total Slices/Pieces	No. eaten as toast
a) White bread incl baguette		
b) Brown bread incl granary, multiseed, best of both. 50/50.		
c) Baps/rolls/teacake		
d) Crumpets		
e) Pizza (1 slice)		
f) Roti/Chappatis		
g) Naan, pitta bread, bagel		
h) Paratha		
Other bread products e.g. wraps, croissants, pancakes, flatbreads, English muffin		

Other please write in

CAFFEINATED DRINKS

H2. During the last 4 weeks of pregnancy, on average, how many cups or mugs of the following drinks would you have per day or per week?

(Glass is 200 ml Cup is 200 ml 1 Mug = 2 cups.
If less than 1 per day enter weekly average)

How many cups of: ?	Per day	Per Week
a) Instant coffee (Caffeinated)		
b) Instant coffee (De-caffeinated)		
c) Filter/cafetiere coffee (Caffeinated)		
d) Filter/cafetiere coffee (De-caffeinated)		
e) Tea (Caffeinated)		
f) Tea (De-caffeinated)		
g) Kashmiri tea (Caffeinated)		
h) Kashmiri tea (De-caffeinated)		
i) Herbal/fruit teas (Caffeinated)		
j) Herbal/fruit teas (De-caffeinated)		
k) Cola (regular, with sugar Caffeinated)		
l) Cola (regular, with sugar De-caffeinated)		
m) Diet or sugar free cola (Caffeinated)		
n) Diet or sugar-free cola (De-caffeinated)		

Draft

SUPPLEMENTS/VITAMINS

H3. Have you taken any dietary supplements including vitamins or iron tablets in the last 4 weeks of pregnancy? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Remember

H3a) If Yes, which:

	Daily	5-6 per week	2-4 per week	Once a week	Less Often
Vitamin C	☐	☐	☐	☐	☐
Vitamin D	☐	☐	☐	☐	☐
Vitamin E	☐	☐	☐	☐	☐
Iron	☐	☐	☐	☐	☐

Other vitamins and dietary supplements, please write in below:

Don't Know ☐

If multivitamins:

Pregnacare	☐	☐	☐	☐	☐
Sanatogen prenatal	☐	☐	☐	☐	☐

Other multivitamins, please write in below:

Don't Know ☐

Section I Water Consumption

***I1. On a typical day how much of the following do you drink?**

		At home	At work/study	Elsewhere
a) Tap water	Glasses per day:	☐☐	☐☐	☐☐
b) Bottled water (Includes water cooler)	Glasses per day:	☐☐	☐☐	☐☐
c) Tea (any sort)	Cups per day:	☐☐	☐☐	☐☐
d) Coffee	Cups per day:	☐☐	☐☐	☐☐
e) Squash (Including any other drinks made with tap water)	Glasses per day:	☐☐	☐☐	☐☐

I2. Do you filter the water you drink at home? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know

I3. Do you filter the water you drink at work? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Don't Know ☐ N/A

I4. In a typical week while you have been pregnant how often and for how long do you undertake the following?
(if you do not do any then fill in 0)

	Times per week	Minutes each time
Shower	☐☐	☐☐☐
Bath	☐☐	☐☐☐
Swim	☐☐	☐☐☐

Section J General Health

Interviewer to give questionnaire for this section to be self-completed.

We should like to know if you have had any medical complaints and how your health has been in general, over the past few weeks. Please answer ALL the questions on the following pages simply by putting a cross by the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past. It is important that you try to answer ALL the questions.

Cross ONE box ONLY for each question - have you:

J1a. Been feeling perfectly well and in good health?

☐ Better than usual ☐ Same as usual ☐ Worse than usual ☐ Much worse than usual

J1b. Been feeling in need of a good tonic?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J1c. Been feeling run down and out of sorts?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J1d. Felt that you are ill?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J1e. Been getting any pains in your head?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J1f. Been getting a feeling of tightness or pressure in your head?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J1g. Been having hot or cold spells?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2a. Lost much sleep over worry?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2b. Had difficulty in staying asleep once you are off?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2c. Felt constantly under strain?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2d. Been getting edgy and bad- tempered?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2e. Been getting scared or panicky for no good reason?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2f. Found everything getting on top of you?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J2g. Been feeling nervous and strung-up all the time?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J3a. Been managing to keep yourself busy and occupied?

☐ More so than usual ☐ Same as usual ☐ Rather less than usual ☐ Much less than usual

J3b. Been taking longer over the things you do?

☐ Quicker than usual ☐ Same as usual ☐ Longer than usual ☐ Much longer than usual

J3c. Felt on the whole you were doing things well?

☐ Better than usual ☐ About the same as usual ☐ Less well than usual ☐ Much less well

J3d. Been satisfied with the way you've carried out your tasks?

☐ More satisfied ☐ About the same as usual ☐ Less satisfied than usual ☐ Much less satisfied

J3e. Felt that you are playing a useful part in things?

☐ More so than usual ☐ Same as usual ☐ Less useful than usual ☐ Much less than usual

J3f. Felt capable of making decisions about things?

☐ More so than usual ☐ Same as usual ☐ Rather less so than usual ☐ Much less capable

J3g. Been able to enjoy your normal day-to-day activities?

☐ More so than usual ☐ Same as usual ☐ Less so than usual ☐ Much less than usual

J4a. Been thinking of yourself as a worthless person?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J4b. Felt that life is entirely hopeless?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J4c. Felt that life isn't worth living?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J4d. Thought of the possibility that you might make away with yourself?

☐ Definitely not ☐ I don't think so ☐ Has crossed my mind ☐ Definitely have

J4e. Found at times you couldn't do anything because your nerves were too bad?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J4f. Found yourself wishing you were dead and away from it all?

☐ Not at all ☐ No more than usual ☐ Rather more than usual ☐ Much more than usual

J4g. Found that the idea of taking your own life kept coming into your mind?

☐ Definitely not ☐ I don't think so ☐ Has crossed my mind ☐ Definitely has

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Study ID | | | | | | P | |

Section K Exercise

Interviewer to give questionnaire for this section to be self-completed

K1. Please tell us about the type and amount of physical activity involved in your paid work.
(Cross ONE box ONLY)

- ☐ I am not in paid employment
- ☐ I spend most of my time at work sitting (such as in an office)
- ☐ I spend most of my time at work standing or walking. However my work does not require much intense physical effort (e.g. shop assistant; hairdresser; childminder)
- ☐ My work involves definite physical effort including handling of heavy objects and use of tools (e.g. cleaner; hospital nurse; gardener, postal delivery worker)
- ☐ My work involves vigorous physical activity including handling of very heavy objects.

K2. During the last week how many hours did you spend on each of the following activities?
(Cross only one box in each row)

	None	Some but less than one hour	1 hour but less than 3 hours	3 hours or more
a) Physical exercise such as swimming, jogging, aerobics, tennis, gym workout etc	☐	☐	☐	☐
b) Cycling, including cycling to work and during leisure time	☐	☐	☐	☐
c) Walking, including walking to work, shopping, for pleasure etc	☐	☐	☐	☐
d) Housework/childcare	☐	☐	☐	☐
e) Gardening/DIY (Do it Yourself)	☐	☐	☐	☐

K3. How would you describe your usual walking pace?

- ☐ Slow pace
- ☐ Steady average pace
- ☐ Brisk pace
- ☐ Fast pace

Please return to the interviewer' - 'Thank you for completing this questionnaire

Draft

Section Interviewer's feedback

L1. Was anyone present with Mother during the interview? (Cross ONE box ONLY)

☐ Yes ☐ No ☐ Part of interview

L1a) If yes or part of interview: who was present? (Cross ALL that apply)

☐ Baby's father ☐ Mother's friend

☐ Mother's mother ☐ Relative

☐ Mother's father ☐ Child

Other (please write in)

L2 Was a transliteration used to administer the questionnaire? ☐ Yes ☐ No ☐ Partially
(Cross ONE box ONLY)

L3 Were there any problems in completing this interview? ☐ Yes ☐ No

L3a) If yes, what were the problems

L4 Do you feel confident with the answers provided? ☐ Yes ☐ No

L4a) If no, why are you not confident?

COMPLETED QUESTIONNAIRE - CHECKED BY STUDY ADMINISTRATOR ☐ Yes

ALSO CHECKED: ☐ M Diet ☐ J General Health ☐ K Exercise

BY: Name

Interviewer Number
(If applicable)

Section M Your diet

Questionnaire about your diet

This short questionnaire asks you about the food you have eaten over the last four weeks of your pregnancy. You may not eat all the foods given or you may find that some of the foods you eat are not included – please do not worry but complete all of the question asked.

Please do not leave any of the lines blank and answer every question even if you are uncertain.

INSTRUCTIONS ABOUT HOW TO COMPLETE THE QUESTIONS

Please put a cross in each box to show how often you have eaten each food item. E.g. if you eat 4 slices of white bread a day – cross the box as shown below

FOOD ITEM	HOW OFTEN HAVE YOU EATEN THIS IN THE LAST 4 WEEKS?							
	Rarely or never	Less than 1 a Week	Once a Week	2-3 times a Week	4-6 times a Week	1-2 times a Day	3-4 times a Day	5+ a Day
White bread	0	1	2	3	4	5	X 6	7

If you make a mistake and cross the wrong box, just cross out and enter the cross in the correct box.

E.g. If you cross you had fruit juice 3 times a day when you meant 3 times a week just cross out the '3-4 times a day' answer and cross the '2-3 times a week' box.

FOOD ITEM	HOW OFTEN HAVE YOU EATEN THIS IN THE LAST 4 WEEKS?							
	Rarely or never	Less than 1 a Week	Once a Week	2-3 times a Week	4-6 times a Week	1-2 times a Day	3-4 times a Day	5+ a Day
Fruit juice (not cordial or squash)	0	1	2	X 3	4	5	~~X~~	7

Draft

M1. The following questions ask about some food and drinks you might have consumed during the last 4 weeks of your pregnancy. Do not be concerned if some things you eat or drink are not mentioned.

Please cross how often you eat at least ONE portion of the following foods & drinks: (a portion includes: a packet of crisps, a serving of chips, one bowl of cereal). **(Please cross ONE box ONLY, but answer EVERY line even if you don't eat that food)**

	Rarely or never	Less than 1 a Week	Once a Week	2-3 times a Week	4-6 times a Week	1-2 times a Day	3-4 times a Day	5+ Times a Day
a) Chips	☐	☐	☐	☐	☐	☐	☐	☐
b) Roast or fried potatoes, hash browns or potato waffles	☐	☐	☐	☐	☐	☐	☐	☐
c) Fibre or bran-rich wheat breakfast cereal, like Weetabix, Fruit 'n Fibre, Bran flakes	☐	☐	☐	☐	☐	☐	☐	☐
d) Oat cereals including muesli, porridge, crunchy oats, instant hot oats	☐	☐	☐	☐	☐	☐	☐	☐
e) Other breakfast cereals like cornflakes, rice krispies, Cheerios	☐	☐	☐	☐	☐	☐	☐	☐
f) Crispbread, like Ryvita	☐	☐	☐	☐	☐	☐	☐	☐
g) Pasta or noodles (also pot noodles, tinned spaghetti)	☐	☐	☐	☐	☐	☐	☐	☐
h) Savouries like Yorkshire puddings, dumplings, pakoras or bhajia	☐	☐	☐	☐	☐	☐	☐	☐
i) Potato crisps	☐	☐	☐	☐	☐	☐	☐	☐
j) Other salted savoury snacks like tortilla chips, Wotsits, Quavers, Bombay mix	☐	☐	☐	☐	☐	☐	☐	☐
k) Cakes, buns, gateaux, doughnuts, muffins	☐	☐	☐	☐	☐	☐	☐	☐
l) Sweet pastries like fruit pies, Danish pastries, custard/curd tarts, croissants	☐	☐	☐	☐	☐	☐	☐	☐
m) Chocolate bars and chocolate coated biscuits e.g. Twix, Kit-Kat, Dairy milk bar	☐	☐	☐	☐	☐	☐	☐	☐
n) Sweet biscuits like digestive, custard creams, gingernut, shortbread	☐	☐	☐	☐	☐	☐	☐	☐

Draft

M2. The following questions ask about types of meat and fish you might have consumed over the last 4 weeks of your pregnancy. Please cross how often you eat at least ONE portion of the following:

	Rarely or never	Less than 1 a Week	2-3 times a Week	4-6 times a Week	7+ times a week
Whole meats					
a) Beef - steaks, roasts, joints, or chops (not in sauce)	☐	☐	☐	☐	☐
b) Pork - steaks, roasts, joints, or chops (not in sauce)	☐	☐	☐	☐	☐
c) Lamb, mutton or goat	☐	☐	☐	☐	☐
d) Chicken or Turkey - steaks, roasts, joints, portions (not in batter, sauce or breadcrumbs)	☐	☐	☐	☐	☐
Processed meats/meat					
e) Meat sausages e.g. Walls or chipolata	☐	☐	☐	☐	☐
f) Beef burgers, either home cooked or takeaway	☐	☐	☐	☐	☐
g) Kebabs	☐	☐	☐	☐	☐
h) Hot dog, frankfurter or saveloy	☐	☐	☐	☐	☐
i) Bacon rashers	☐	☐	☐	☐	☐
j) Meat pies and pastries (sausage roll, pasties, meat samosa, steak/meat pie)	☐	☐	☐	☐	☐
k) Chicken/turkey nuggets, Kiev, turkey or chicken burgers, chicken pies, or in batter or breadcrumbs	☐	☐	☐	☐	☐
l) Ham	☐	☐	☐	☐	☐
m) Cured/dried sausage e.g. Chorizo, Salami	☐	☐	☐	☐	☐
Meat dishes					
n) Chicken or turkey with sauce e.g. curry, stir-fry, casserole	☐	☐	☐	☐	☐
o) Beef, lamb or goat in sauce e.g. curry, stew, Shepherd's pie, Bolognese sauce, Chilli con carne, Lasagne	☐	☐	☐	☐	☐
p) Pork in sauce e.g. stew, casserole or stir-fry	☐	☐	☐	☐	☐
q) Gravy made with pan or meat juices (not instant)	☐	☐	☐	☐	☐
Fish					
r) White fish in batter or breadcrumbs, like 'fish 'n chips'	☐	☐	☐	☐	☐
s) White fish not in batter or breadcrumbs e.g. cod in parsley sauce, fish curry (marsala fish), fish pie	☐	☐	☐	☐	☐
t) Tinned tuna	☐	☐	☐	☐	☐
u) Fresh or tinned oily fish like sardines, mackerel, salmon, trout (not tuna)	☐	☐	☐	☐	☐
v) Smoked fish, like smoked mackerel, kippers or smoked salmon	☐	☐	☐	☐	☐
w) Salted/dried fish e.g. 'Bombay duck'/bummalo	☐	☐	☐	☐	☐

Draft

M3. If eaten in the last 4 weeks of pregnancy how did you mainly cook the following?
Please enter only one cross on each line for cooking method. Cross yes if mainly eaten very well done, crispy or heavily browned as shown.

	Did not eat	Don't know or take-away	Grill	Fry	Roast	BBQ	Well done? Yes	No
a) Beef - steaks, roasts, joints, or chops (not in sauce)	☐	☐	☐	☐	☐	☐	☐	☐
b) Beef burgers, either home cooked or takeaway	☐	☐	☐	☐	☐	☐	☐	☐
c) Pork - steaks, roasts, joints, or chops (not in sauce)	☐	☐	☐	☐	☐	☐	☐	☐
d) Lamb, mutton or goat - steaks, roasts, joints, or chops (not in sauce)	☐	☐	☐	☐	☐	☐	☐	☐
e) Chicken or Turkey-steaks, roasts, joints, portions (not in batter, sauce or breadcrumbs)	☐	☐	☐	☐	☐	☐	☐	☐
f) Meat Sausages e.g. Walls or chipolata	☐	☐	☐	☐	☐	☐	☐	☐
g) Bacon rashers, chops or bacon ribs	☐	☐	☐	☐	☐	☐	☐	☐
h) White fish fillets or steaks e.g. cod or haddock NOT in batter	☐	☐	☐	☐	☐	☐	☐	☐
i) Oily fish fillets or steaks e.g. salmon, mackerel, trout	☐	☐	☐	☐	☐	☐	☐	☐

M4. a. Are you familiar with the "5 a day" recommendations for fruit and vegetables?

☐ Yes ☐ No

b. Do you consume 5 portions of fruit and vegetables per day?
(Please place a CROSS in ONE box ONLY)

☐ Always ☐ Sometimes ☐ Never

(Please place a CROSS in ONE box ONLY)
M5. Where does most of your advice about healthy eating during pregnancy come from?

☐ Family members ☐ GPs/Doctors

☐ Friends ☐ Midwife/Health Visitor

☐ Magazines/Newspapers ☐ Other

☐ Books

Thank you for completing this questionnaire - please leave it in the place indicated.

Appendix 2. Seven day food diary.

FOOD DIARY

Study No.

CONFIDENTIAL

INTRODUCTION

We would like you to keep this diary of everything you eat and drink over the next seven days.

This is a very important part of the study and will add greatly to the information you have already given us about your usual diet.

Completing this diary carefully will take you some time, but the valuable record given by you, and many others in this study, will help us understand more fully the effects of diet on health.

It is very important that you do not adjust what you eat and drink just because you are keeping a record. Please continue to eat whatever you would eat normally.

Please provide us with as much detail as you possibly can.

When you have completed the food diary, please post this booklet back to us.

Thank you

GENERAL INSTRUCTIONS

1. As you will see, each day is marked in sections, beginning with first thing in the morning and ending with bedtime. For each part of the day:
   - Write down all food and drink consumed, the amounts and a description.
   - If nothing is eaten or drunk, draw a line through that section.
   - At the end of each day there is a list of snacks and drinks that can easily be forgotten. Please write any extra items in here if you have not already recorded them in some other part of the day.
   - If you prepare a recipe, please write it in the recipe box provided at the end of each day.
2. Please try to record everything at the time of eating, not from memory at the end of the day.
3. Please read pages 3-8 for help in describing the foods and drinks you have eaten. Pages 9-15 include a range of photographs and page 16 shows an example of part of a completed diary.
4. Give **brand and full name** of products from packaging. Many commercial foods have **weights** printed on them, so please use these to show how much you ate.
5. Please answer the questions at the back of the diary (pages 45-48), **after** you have completed the seven days.

DETAILED INSTRUCTIONS

The following section is a list of popular foods and drinks. Next to each item is the sort of thing we need to know so that we can tell what it is made of and how much you had. This list cannot cover all foods and drinks, so if anything that you have eaten is missing try to relate it to a similar item. Please give as much detail as you can. For an example of how you might describe foods you have eaten see page 16.

Please try to state what sort of oil or fat was used for baking, frying etc.

State clearly whether spread was used on crackers and biscuits as well as on bread, rolls, toast and in sandwiches.

Food/Drink	Description & Preparation	Amount
Homemade dishes	Describe as fully as possible, include name of dish; give recipe or ingredients, including amounts if known	Tablespoons One of the suitable photos
Ready-made meals	Give name of dish as described on pack with brand, describe main ingredients and enclose label e.g. beef lasagne, deep pan pizza, fish pie etc.	Weight from packet including proportion of pack eaten (all or half?) Tablespoons; one of the suitable photos
Meals eaten away from home or take-away meals	Please describe all dishes and give main ingredients e.g. lamb tikka masala and pilau rice, other indian and oriental dishes, fish and chips, burgers, pizza etc.	Proportion of takeaway or restaurant carton Describe meal size and dimensions where appropriate Tablespoons; one of the suitable photos
BEVERAGES		
Alcoholic drinks e.g. beer, lager, cider, sherry, wine, spirits and liqueurs	Describe type and give alcohol content especially for beers, lagers and wines	Number of pints Number and size of cans, bottles or glasses Number of measures Volume (fl. oz. or ml.)
Fruit juice *Fruit drinks* *Soft drinks*	Without added sugar With added sugar Brand name, regular or diet or low calorie	Glasses, cartons, cans or bottles with volume
Coffee	Instant or ground; decaffeinated or caffeinated; with milk or sugar	Cups or mugs Volume if available
Tea	Tea leaves or tea bag, with milk or sugar. If instant: black or white, sweetened or not	Cups or mugs Volume if available
Milk based or hot chocolate type drinks	Name or type of drink; regular, reduced fat or low sugar Type of milk used	Cups or mugs Volume if available
Water	Tap, bottled or filtered	Glass, tumbler; volume
BISCUITS / CRACKERS		
Sweet biscuits	Brand and full product name plus description e.g. sandwich, wafer, chocolate half-coated, full-coated, cream-filled Ingredients if homemade	Number of biscuits and size
Crackers, crisp bread, savoury biscuits	Brand and full product name plus description e.g. Carr's water biscuits, Original Ryvita, Jacob's Cholcegrain	Number of crackers and size
BREAD		
Bread	White, brown, granary, wholemeal, containing seeds, ciabatta, focaccia, french type, baguette. Was the loaf pre-sliced or hand-cut?	Size of loaf: large or small Thickness of slice Number of slices
Rolls or buns	Describe rolls: crusty, soft, baps, petit pain, finger	Size of rolls and number
Sandwiches	Remember to describe type and amount of spread and filling	Number of rolls or slices of bread
BREAKFAST CEREALS		
Breakfast cereal	Brand and full name e.g. Jordan's Natural Muesli, Sainsbury's Malties *Remember to describe milk and sugar added separately*	Photo 1 Tablespoons Milk on cereal: large, medium or small amount
Porridge or Ready Brek	Porridge oats or Ready Brek Type of milk used to make it or was water used? *Remember to describe milk and sugar added separately*	Photo 1 Amounts of ingredients
Bran: *wheatbran* *wheatgerm* *oatgerm and bran*	Added separately to breakfast cereal or mixed with other foods such as porridge. Please describe type and brand	Dessertspoons or tablespoons

BUTTER, MARGARINES, FATS & OILS		
Butter, spreads or margarines	Please give specific brand, full name as described on packaging plus the percentage (%) fat if known	Photo 18 for spread on bread or rolls For crackers and biscuits describe thickness of spread
Oils	Describe type of oil used in cooking or dressings e.g. corn, olive, sunflower	Tablespoons
CAKES		
Cakes, scones and sweet buns, pies and pastries	*Homemade* – describe ingredients and recipe *Commercial* – give brand and product name with description Does cake contain filling e.g. whipped cream, butter icing or have a coating or covering? Are pies made with pastry top and bottom?	Proportion of whole cake or pie Size of slice or individual cake Photos 15 and 16 for cake Photo 3 for pies or flans
	Are scones or cakes spread with butter, margarine and/or jam?	How many whole scones or halves?
CHEESE		
Hard cheese (includes Brie, Danish Blue etc.)	Specify type e.g. Cheddar, Wensleydale, Brie	Photo 2 (amount eaten is equal to the slice OR the chunk OR the grated cheese) Number and size of slices or chunks
Philadelphia type soft cheese or cheese spread	Regular or reduced fat cheese Specify brand and fat content	Thick or thin spread Teaspoons
DESSERTS/PUDDINGS		
Puddings	Describe type and ingredients e.g. apple crumble, raspberry cheesecake with biscuit base, dairy cream trifle with banana *Served with custard, ice cream, cream or yogurt? (see milk)*	Photo 17; tablespoons Size of slice; weight of carton for commercial items Photo 3 for pies or flans
EGGS		
Eggs and egg dishes	Boiled, poached, fried, scrambled, omelette plus topping or other ingredients Was fat or oil used in cooking? Give type of fat or oil used	Size of eggs Number of eggs consumed

FISH		
Fish and fish dishes	Type of fish; fresh, frozen or canned, cooking method; from fish and chip shop, homemade or commercial; battered or breadcrumbed	Weight (with or without bones/skin?); size of whole or piece of fish Photo 6
FRUIT		
Fruit	Type of fruit; fresh (was skin eaten or not?), frozen, dried; stewed with or without sugar Canned in syrup or juice	Number of whole fruits Tablespoons; weight (with or without skin) Weight of can
MEAT		
Ham, salami *Cold meats* *Roast meats*	Type Cut from joint or pre-sliced	Weight; number and size or thickness of slices Photo 4
Bacon	Back, middle, streaky; unsmoked or smoked Rashers or chops	Number of rashers or chops Weight (raw or cooked)
Gammon	Steaks, rashers or cut from joint	Weight (raw or cooked) Number and size
Sausages	Type, cooking method	Number and size
Chops and steaks	Type and cut, cooking method Was the fat eaten?	Number and size Weight (raw or cooked)
Meat dishes	Recipe or brand and product name with ingredients	Photo 5, 19, or 20 Tablespoons; pack weight
MILK/DAIRY		
Milk	Whole, semi-skimmed or skimmed; percentage (%) fat if known Pasteurised, UHT or sterilised	Tablespoons Volume in fl.oz. or ml.
Powdered milk	Dried skimmed milk or with added vegetable fat	Teaspoons; volume of made up milk
Coffee or tea creamer or whitener	Brand and product name e.g. Coffeemate Please state if powder or liquid	Teaspoons Individual cartons or sachets
Cream	Single, whipping or double; dairy or non-dairy; regular or reduced fat Liquid, whipped or aerosol	Tablespoons Volume
Yogurt and fromage frais	Brand and specific product name or description, fat content as on carton	Tablespoons; size of carton (g. or ml.)
Ice cream	Brand and product name; regular, reduced fat or made with cream	Scoops Tablespoons
Non-dairy milk	Soya, oat or rice milk; brand; product description; fortified with calcium; sweetened?	Tablespoons Volume

PASTA		
Pasta and spaghetti incl. filled pasta	Dried or fresh pasta; white or wholemeal; describe type e.g. fusilli or tagliatelle Filled pasta e.g. Tortelloni with spinach and ricotta	Weight (raw or cooked) Photo 9 Proportion of packet weight
Pasta dishes	Lasagne, cannelloni or pasta bakes; give recipe and ingredients for homemade; brand, product name and description for commercial	Photo 20 Packet weight
Pasta sauce	Describe sauce type and ingredients	Tablespoons Volume or weight of commercial product
RICE		
Rice	White or brown, long grain or basmati	Photo 8 Weight (raw or cooked)
Rice dishes	Give recipe and ingredients for homemade; brand, product name and description for commercial	Photo 8; tablespoons Packet weight and proportion eaten
SAUCES & SOUPS		
Sauces and ketchups including dips	Describe brand and product name or recipe and ingredients	Tablespoon or teaspoons Volume or weight of commercial product
Soups	Describe type and ingredients Is soup homemade, canned, condensed, dried packet, instant, fresh/carton or low calorie?	Bowls, cups or mugs Volume in fl.oz. or ml. Weight of can and proportion eaten
Gravy	Describe brand and product name or recipe and ingredients Made with cornflour, bisto powder, granules; with or without added meat juices, stock or vegetable juice	Tablespoons Volume in ml. or fl.oz.
Dressings	Type and ingredients; brand and product name; regular, reduced fat or fat free	Tablespoons or teaspoons
Mayonnaise	Regular or reduced fat	Tablespoons etc.
SAVOURY DISHES		
Pies, flans and quiches *Pizza* *Pancakes* *Sausage rolls* *Filled tortillas or burritos*	Describe dish and ingredients, brand and product name	Product weight and proportion eaten Number of slices or individual items eaten

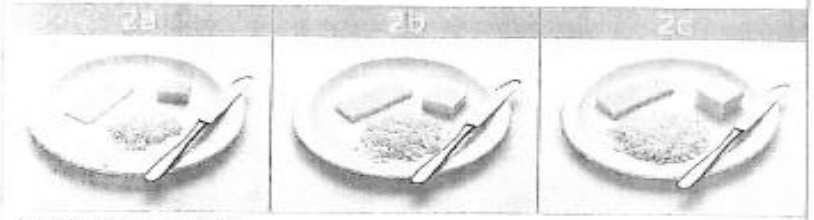
SAVOURY SNACKS		
Crisps and snacks *Nuts*	Brand name and description Type; fresh or roasted; salted or unsalted	Weight of packet Number of items eaten
SPREADS & CONDIMENTS		
Jams, other preserves and spreads	Brand name and type of spread Jam, honey, marmalade Peanut butter, other nut butters Chocolate spread Marmite and savoury spread	Thin, medium or thick spread
Salt, pepper, mustard	Describe type	Sprinkle; teaspoons
SUGARS & CONFECTIONERY		
Sweets and chocolate	Describe type and brand	Weight; number of pieces, whole bars or individual sweets
Sugars and sweeteners	Type of sugar Brand and type of sweetener	Teaspoons Tablets or spoons
VEGETABLES (including herbs)		
Vegetables and salad including lentils, beans and baked beans	Type of vegetables; fresh, frozen or canned; cooking method or raw If roasted was fat added? Was butter, sauce or dressing added?	Photo 12,13 or 14 Number of whole vegetables Tablespoons
Vegetable dishes including dishes with potato, beans, lentils or pulses	Recipe or brand and product name with ingredients	Photo 5 or 20 Weight of commercial dish
Potatoes	Boiled; roasted with or without fat; fried; sautéed; mashed with or without added fat or milk	Photo 10 or 11
Chips	Homemade; commercial e.g. oven chips; takeaway Size and cut of chip	Photo 7
Herbs and spices	Fresh or dried	Teaspoons or other spoons; leaves; sprigs
VEGETARIAN		
Vegetarian products and dishes with Quorn, soya or TVP or tofu	Describe dish or product and ingredients, brand and product name e.g. Quorn sausages, Vegetable stir-fry with tofu	Weight from packaging Number of items Number of slices of meat substitute Photo 5 Tablespoons

Please choose an appropriate photo to indicate the portion size you have eaten. To help you make this choice, there are some notes below the photos. Write down the picture number and size nearest to your own helping e.g. 2a, 3b or 1c.

The large white circle in the background shows the actual size of the 10" dinner plates used in the photos. Items such as the cake are photographed on a 7" tea plate.

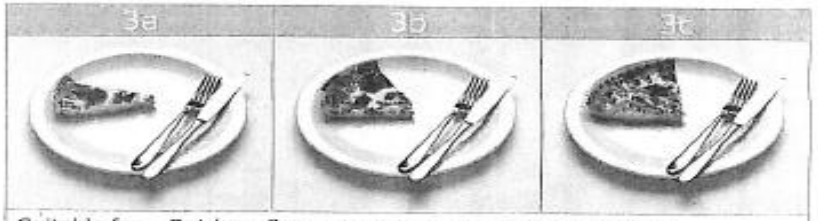
Refer to the detailed instructions on pages 3 - 8 where * is indicated.

Suitable for – Corn flakes and other breakfast cereals

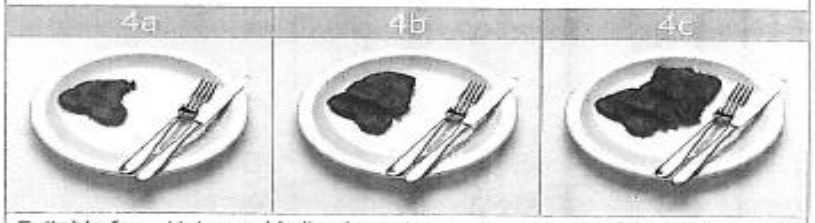


Suitable for – Cheese
Not for – Butter, margarines and spreads (see photo 18)

PLEASE NOTE: *When choosing one of the photos above, the amount you eat is equal to either the slice* ***OR*** *the chunk* ***OR*** *the grated cheese on one plate*

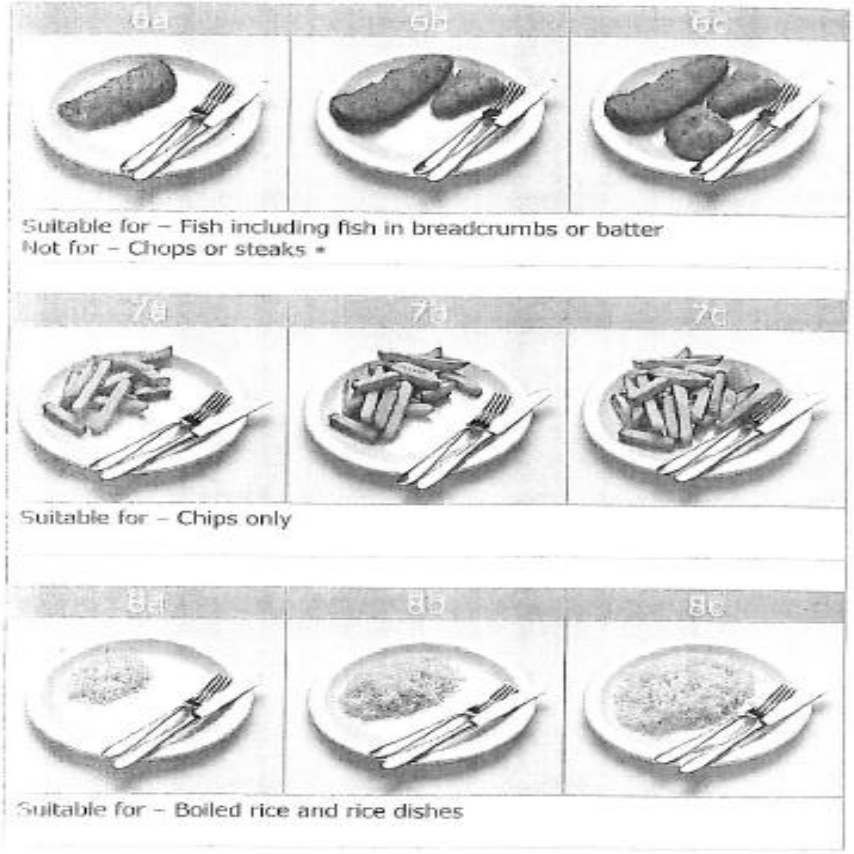


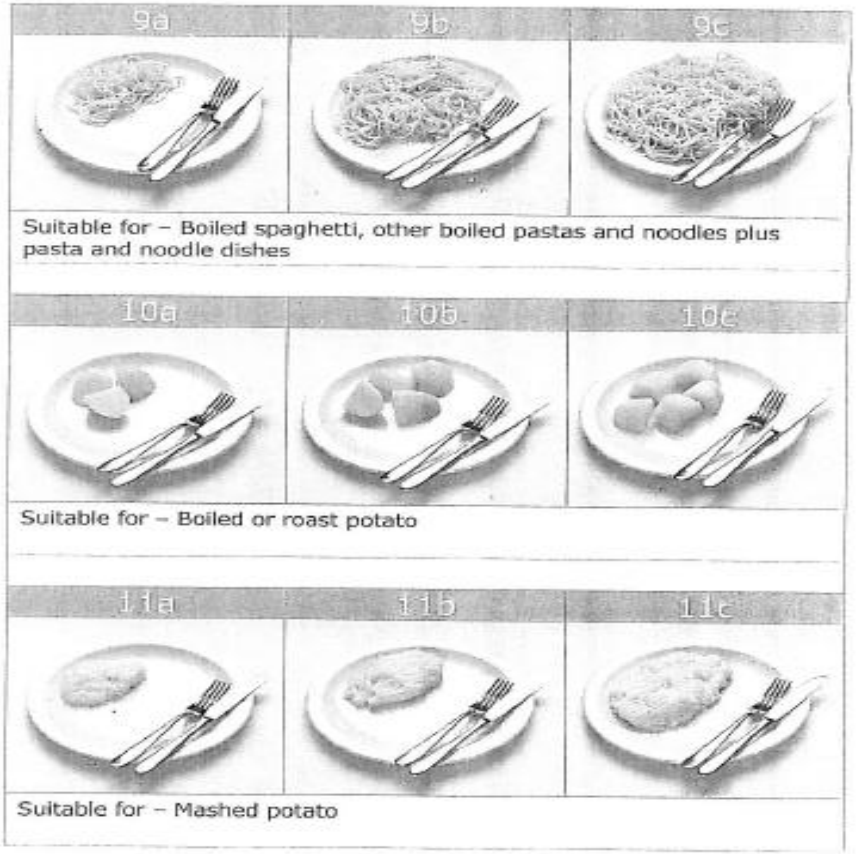
Suitable for – Quiches, flans, savoury or sweet pies and pizza
Not for – Cakes (see photos 15 and 16)



Suitable for – Hot or cold sliced meats, e.g. roast meat, ham or gammon
Not for – Chops, steaks or bacon rashers *

Suitable for – Vegetable stews or meat stews and casseroles WITH vegetables, also bolognaise sauce
Not for – Meat stews WITHOUT vegetables (see photo 19)

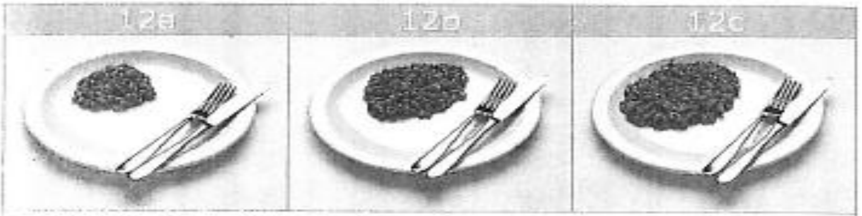




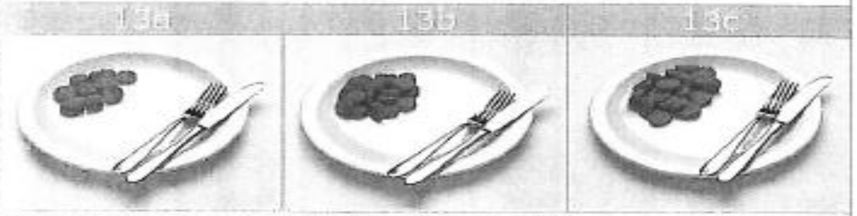
10" PLATE

11

12



Suitable for – Baked beans and peas



Suitable for – Carrots and other similar vegetables

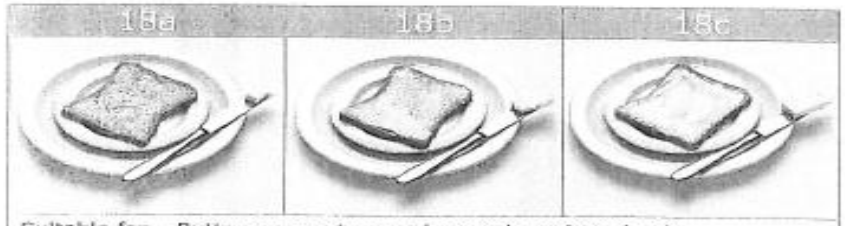
Suitable for – Cabbage, other leafy vegetables and salads
Not for – Peas (see photo 12)

Suitable for – Sponge cake and other similar cakes
Not for – Quiches, flans and sweet or savoury pies (see photo 3)

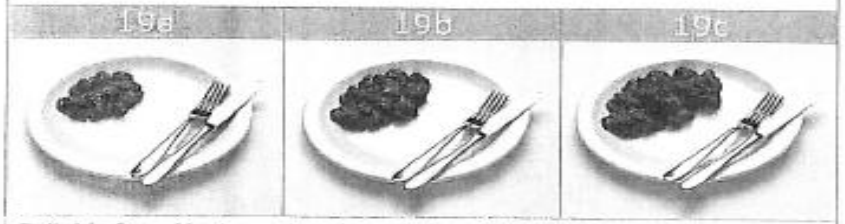
Suitable for – Fruit cake and other cake types with same shape
Not for – Meat (see photo 4) *

Suitable for – Fruit crumble and other puddings and desserts
Not for – Puddings WITH custard, sauce, yoghurt or ice cream combined *

10" PLATE



Suitable for – Butter, margarines and spreads on bread only



Suitable for – Meat or minced meat stews WITHOUT vegetables
Not for – Meat stews WITH vegetables (see photo 5)

Suitable for – Shepherd's pie and similar dishes or lasagne

Food/Drink	Description and Preparation	Amount
	LUNCH	
	Canteen at work	
Beef cass.	Beef casserole (onion and carrots)	Photo 5b
Potatoes	Mashed potatoes	2 scoops
Vegetables	Boiled cabbage	Photo 14a
Dessert	Rhubarb crumble	Photo 17b
	Custard	2 small ladles
Tea	Tea bag	1 plastic cup
	Milk - semi-skimmed (no sugar)	1 tbsp
	TEA – between lunch time and evening meal	
Sandwich	Brown bread, large sliced loaf	1 medium slice
Spread	St. Ivel Utterly Butterly	thick spread
Filling	Grated cheddar cheese and tomato	1/2 x Photo 2c 2 slices
Apple	Small Braeburn - ate skin	1 fruit
Tea	As lunch with whole milk	1 large mug 3 tbsp milk
Chocolate	Cadbury's Dairy Milk - small bar	1 (49g)
	EVENING MEAL	
Chicken & vegetable stir-fry	Skinless and boneless chicken breast, packaged, 300 gram raw Vegetable oil 1 large carrot, 2 spring onions 1 small courgette, 1 med. red pepper, 4 oz button mushrooms 2 tsp grated ginger, 1 tbsp soy sauce, 1 tbsp sherry	Ate ½ of this recipe
Rice	White rice, boiled	4 heaped tbsp
Fruit yoghurt	Muller Fruit Corner - strawberry	1 carton (175g)
Red wine	Cabernet Sauvignon (14.5% alcohol)	1 large wine glass (270 ml)

DATE / / DAY OF THE WEEK:

BEFORE BREAKFAST

Food/Drink	Description and Preparation	Amount

BREAKFAST

Food/Drink	Description and Preparation	Amount

MID MORNING – between breakfast time & lunch time

Food/Drink	Description and Preparation	Amount

LUNCH

Food/Drink	Description and Preparation	Amount

TEA – between lunch time & the evening meal

Food/Drink	Description and Preparation	Amount

EVENING MEAL

Food/Drink	Description and Preparation	Amount

LATER EVENING – up to last thing at night

Food/Drink	Description and Preparation	Amount

ANYTHING ELSE?
Between meal snacks and drinks NOT already written in before

Food / Drink	Description and Preparation	Amount
Chocolate		
Toffees, sweets		
Crisps, peanuts		
Other snacks		
Beer, wine		
Sherry, spirits		
Other cold drinks		
Tea, coffee		
Other hot drinks		
Ice cream		
Anything else?		

Space to write in the recipe or ingredients of any home-made dishes, take-away meals etc. that you have mentioned but not described previously. Where applicable, please list amounts of ingredients and brand names. **Please indicate the amount or proportion actually consumed by yourself.**

END OF DAY No. 1

GENERAL QUESTIONS ABOUT YOUR FOOD/DRINK *LAST WEEK*

1. *Which type of milk did you most often use last week?* ***Select one only.***

Whole/full cream	Soya
Semi-skimmed	Other:
Skimmed/fat free	No milk used

Do you know the fat percentage (%) of your milk?:

Was this milk: pasteurized? UHT? sterilized? dried?

2. *How much milk did you usually have in tea, coffee and on your cereal?*

Tea:	A lot	Average	Hardly any	No milk used
Coffee:	A lot	Average	Hardly any	No milk used
Cereal:	A lot	Average	Hardly any	No milk used

3. *Did you drink decaffeinated tea or coffee?*

Tea:	Always	Sometimes	Never
Coffee:	Always	Sometimes	Never

4. *Which types of fat did you use last week for baking, frying, spreading and on salads?* **If you are not sure which category to indicate, check packaging for the exact name, fat content and brand and fill in this information.**

Type of fat, spread or margarine	Brand and name of product	Spreading	Frying	Cooking	Salads
Butter					
Spreadable butter					
Dairy spread (e.g. I can't believe it's not butter)					
Polyunsaturated spread (sunflower, soya or vegan)					

4. *(continued....)*

Type of fat, spread or margarine	Brand and name of product	Spreading	Frying	Cooking	Salads
Low fat spread (less than 60% fat)					
Olive oil based spread					
Other soft margarine or spread – 1					
Other soft margarine or spread – 2					
Hard margarine					
Vegetable oil - 1	*Type:*				
Vegetable oil - 2	*Type:*				
Lard					
White vegetable fat					
Dripping or animal fat					
Other					

5. *Which type of bread did you eat most often last week?* ***Select one only.***

White	Soft grain
Granary	Brown
Wholemeal	Wheatgerm
Other:	

6. *Did you eat butter, margarine or spread last week?* ***Please tick boxes below to show whether you ate it on toast, bread, sandwiches, in rolls or on crackers:***

	Toast	Bread	Sandwiches	Rolls	Crackers
Always					
Sometimes					
Never					
Don't know					

7. *How thickly did you spread butter, margarine etc. on bread or crackers?*

Thick	Medium
Thin	None

8. *If you ate grilled, fried, barbecued or roast meat last week, how well cooked was it?* ***Please tick the boxes.***

	Beef, lamb, pork	Poultry
Well done or dark brown		
Medium		
Lightly cooked or rare		
Did not eat meats cooked by these methods		
Did not eat these meats		

9. *If you ate meat last week, what did you do with the visible fat?* ***Please note that meat includes beef, lamb, pork, ham and bacon.***

Ate all of the fat	Ate most of the fat
Ate some of the fat	Ate as little as possible
Did not eat meat	No fat eaten

10. *If you ate poultry last week, did you eat the skin?* ***Please note that poultry includes chicken, duck, goose and game birds.***

Yes	No
Sometimes	Did not eat poultry

11. *If you had gravy last week, were the meat juices, pan residues or dripping put into the gravy?*

Yes	No	Sometimes
Don't know	Did not eat gravy	

12. *Was salt usually added to your food during cooking last week?*

Yes	No	Don't know

Did you usually add salt to your food at the table last week?

Yes	No	Don't know

Did you regularly use a salt substitute (e.g. LoSalt) last week?

Yes	No	Don't know

If YES, which brand?

13. *Did you eat the skin on fruit?* ***Please tick boxes.***

	Apple	Pear
Skin eaten		
Skin not eaten		
Fruit not eaten		

14. *Please name any vitamins, minerals or other food supplements taken on each day of last week.* ***Please write down all the details from each packet/container or enclose label(s). Give the number of tablets taken on each day.***

Brand	Name	Strength	Tablet capsule tsp.	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Boots	*High strength vitamin C*	*1000 mg*	*Tablet*	*1*	*1*	*0*	*2*	*1*	*1*	*1*

15. *Which types of water did you consume last week?* ***Please give information for both HOT and COLD drinks.***

Water type	Hot drinks	Cold drinks
Tap water (unfiltered)		
Filtered water – hard water filter		
Filtered water – other		
Bottled water – *brand:*		
Other water – *brand:*		

16. *Were any of the following foods which you ate last week produced* ***organically*** *(without pesticides)?* ***Please tick the necessary box(es).***

Vegetables, homegrown	Vegetables, purchased
Fruit, homegrown	Fruit, purchased
Milk and dairy products	Cereal or cereal products, bread
Meat	No organic foods eaten

This space has been left for you to tell us about anything else which you feel is important about your food/drink intake last week.

Please post the diary back to us.

Thank you very much for your help in completing such a detailed record.