

**MATERNAL NUTRITION KNOWLEDGE, ATTITUDES, AND PRACTICES OF
PREGNANT WOMEN ATTENDING SOS HOSPITAL MOGADISHU, SOMALIA**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
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APPLIED HUMAN NUTRITION**

DEPARTMENT OF FOOD SCIENCE NUTRITION AND TECHNOLOGY


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DECLARATION

This dissertation is my original work and has not been submitted for the degree award in any other University.

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DEDICATION

This work is dedicated to my entire Hassan Mohamoud family for their unwavering encouragement and support throughout my studies. Thank you for being helpful and understanding throughout the period, brother Mr. Jamaal Hassan and dear sister Amina Muqtaar, thank you for providing a solid foundation for my life, Mr. Hassan Mohamoud and Mrs. Medina Ali.

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ABBREVIATIONS AND ACRONYMS

ANC	Antenatal care
EMOC	Emergency Obstetric Care Services
IDP	Internally Displaced People
ISSC	International Social Science Council
KEMRI	Kenya Medical Research Institute
LBW	Low Birth Weight
MMR	Maternal Mortality Rate
MOH	Ministry of Health
OPD	Outpatient Department
PE	Pre-Eclampsia
SOS	Safe Our Souls
SSA	Sub-Saharan Africa
TT	Tetanus Toxoid
UN	United Nations
FAO:	Food and Agriculture Organization
FSNU:	Food Security and Nutrition Analysis Unit
UNICEF	United Nations Children's Fund
UON	University of Nairobi
SDGs	Universal Sustainable Development Goals
WHO	World Health Organization
SPSS	Statistical Package for Social Sciences
SMART	Specific, Measurable, Attainable Realistic, and Timely
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees

OPERATIONAL DEFINITIONS

Maternal nutrition: The term "maternal nutrition" mainly centers on mothers. The nutritional status affects the mother's and baby's health related to childbirth and childcare during pregnancy.

Nutritional status is an individual's physiological condition due to the link between daily diet and needs and the body's capacity to digest, absorb, and utilize the nutrients.

Good Nutrition; Grains are a vital energy source Filled with antioxidants, food, water-soluble and fat-soluble vitamins, fruit, and vegetables. Meats, nuts, and legumes add protein, folate, and iron to your body. Dairy products are a decent source of Vitamin D and Calcium. Good knowledge and practice: Nutritional awareness and habits of pregnant women and their antenatal care providers are factors that affect pregnant women's dietary intakes.

Anthropometric measurements: Standardized bone, muscle, and adipose tissue tests used to determine body composition. The main elements of anthropometry are weight, skinfold thickness, body circumferences (hip, waist, and limbs), body mass index (BMI), and height.

Body mass index is a parameter for relating weight to height.

BMI is now the key parameter used by the National Institute of Health to define an individual's body weight in place of the traditional charts.

Preeclampsia is a prenatal complication associated with high blood pressure and indications of organ damage, most often the kidneys and liver.

Eclampsia is a pregnancy condition with elevated blood pressure and excessive quantities of urinary protein or other liver dysfunctions. Onset can be before, during, or after delivery

Antenatal care (ANC) is identified as the medical attention given to prenatal women and teenage girls trained medical professionals to give the best health state for both mother and fetus throughout the pregnancy period.

Postnatal health care organizations reported that this care is defined as service and medical attention given to the mother and the newborn child for the first six weeks of life immediately after the birth of the placenta. Most maternal and neonatal deaths occur during infancy and the postpartum period.

Maternal Knowledge: enables women to understand their health challenges better and take appropriate measures to improve their health status.

Maternal attitude: After correcting for ethnic health conditions, maternal views were related to anxiety symptoms, but this effect was no longer substantial after controlling for mental and emotional risk factors.

Nutrition knowledge: is the understanding of ideas and processes connected to health and nutrition, such as nutrition and lifestyle, dietary and illness, foods representing major micronutrients, and nutritional standards and guidelines.

Malnutrition: is the condition caused by an imbalance in food intake and needs. It comprises malnutrition caused by a lack of food and strenuous physical activity, and overnutrition, which is caused by an excess of food and a lack of physical activity.

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ABSTRACT

According to the World Health Organization (WHO), most women do not consume or lack, thereof, adequate micronutrients during their reproductive years and pregnancy. Health facilities (a potential source of nutrition knowledge) partly influence deterioration of pregnant mothers and women nutritional conditions owing their sparse distribution and probably understaffed, especially in Somalia. Majority of unsuccessful birth outcomes are partly as a result of poor nutritional status of pregnant mothers and women owing to low nutrition knowledge, poor attitude, and inadequate nutrition practices. Therefore, this study purposed to determine the association of maternal nutritional knowledge, attitudes, and practices with the birth outcomes among pregnant mothers and women in Haliwaa, Somalia. As a result, a cross-sectional research was done to evaluate the dietary awareness, attitudes, and practices on 384 expectant mothers and women. A semi-structured questionnaire was used a tool for collecting the quantitative and qualitative data through a face-to-face interview. Additionally, this further was supplemented with a focus group discussion on pregnant women's dietary knowledge, attitudes, and practices. The quantitative and qualitative data were analyzed using SPSS software version 20.0 and ENA.

From the results, married pregnant mothers were the majority at 77.9%, followed by widows (12.2%), while divorce women were 9.9%. The unemployed respondents (56.3%) were significantly more than self-employed at 26.3% and employed (salaried) at 17.4%. About a quarter of the respondents (25.3%) had attained secondary education, while 4.7% had an elementary education and 23.5% had informal education. The mean parity was 4.67 ± 2.38 pregnancies per woman with a range of 10. The mean number of children per household was 4.59 ± 2.330 , with a range of 10 children. The mean number of ANC visits was 2.44 ± 0.497 , with a minimum of 2 visits and a maximum of 3. There was a remarkable difference in the illness quoted by the participants,

with anemia being the highest at 45.3%, followed by diabetes at 12.5% and hypertension at 5.5%. Those who did not report any illness were 36.7%. About 33.3% of the respondents said no medical condition was experienced on the day of the interview. About 88.3% of the women were knowledgeable about sources of vitamins, followed by those who identified sources of carbohydrates (69.3%), and about half of the women (54.7%) were aware of sources of proteins. Significantly few women identified sources of energy (22.3%). Only 14.6% of the women knew that foods could provide more than one kind of nutrient. The mean number of additional meals taken by pregnant women in the study population (82.6%) was 3.30 ± 0.459 with a minimum of 3 and a maximum of 4. About 62.5% consumed snacks in between meals. All the pregnant women (100.0%) knew that a balanced diet is essential during pregnancy, and slightly less than a third (28.0%) did not know about foods that are rich sources of Iron.

Results from focus group discussions indicated that the respondents were knowledgeable about the clinical definition of high blood pressure. Additionally, the group agrees that high blood pressure can lead to premature delivery due to the placental deprivation of blood flow. Attendance to the antenatal clinic was essential for pregnancy and maintaining a healthy diet because they determined the fetal outcome. The level of education among women is still deficient. Expecting women's attendance at prenatal clinics was low. The study population had a high prevalence of iron deficiency anaemia. Women are well aware of the importance of essential nutrients but are not informed on the exact sources of these nutrients. Pregnant women perceive medication intake as detrimental to their pregnancies since it is likely to affect fetal health. It is, therefore, essential to institutionalize nutritional education. The government should do more sensitization on the importance of early and regular attendance at antenatal clinics, do more on supplementation

programmer, especially for the iron-deficient pregnant mothers, and come up with appropriate policies to guide these supplementation programmers.

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Background information

Following the persistent poor feeding and food condition of expectant mothers and women potentially transpire to risk complications on the unborn child as well as malnutrition conditions on the newly born babies. . Similarly, Nnam *et al.* (2015) showed that the majority of expectant mothers and women feed on low nutrition diets. Unfortunately, most expectant mothers and women besides being not aware and at disposal of recommended diet for themselves and their unborn child or children, too lack adequate knowledge of potential risks associated with a properly balanced diet for unborn children (Oyunga *et al.*, 2016). Even though the right to sufficient nutrition is codified in Ethiopian law and massive nutrition initiatives have been implemented, nutritional deficiencies and infectious illnesses remain among the nation's biggest health challenges (Ethiopia Demographic and Health Survey, 2016). For example, in Ethiopia, cases of malnutrition among expectant mothers and women although high among poor households, are too reported among financial stable households (Ethiopia, Public Health, 2017). Therefore, to mitigate this chronic challenge of malnutrition amongst expectant mothers and women, interactive-based approaches such as attitude and nutrition awareness through mid-wives needs enormous enhancement, purposely to improve the feeding condition and health of unborn children (BMC Public Health, 2013).

For instance, A study by Kamau *et al.* (2019) showed the relevance of nutrition awareness, whereby it enhances nutritional knowledge from a psychological perspective as well as actionable mitigation through healthy diets. Educating expectant mothers and women on nutritional diets has proven beneficial to the health of the mothers as well as that of the unborn child, more so

minimizing against risks of malnutrition in both (BMC Public Health, 2013). In estimating the risks partly associated with malnutrition among expectant mothers and women, developing countries recorded the highest maternal death of 249 per 100 000 deliveries compared to 14 per 100 000 deliveries in developed countries, in 2015. Even so, in Africa, the projected maternal mortality rate is one in every 38 whereas the developed nations are one in every 3700. Particularly in Somalia and Chad, the maximum adult lifetime risk of maternal death stands at 1 in 15 and 1 in 18, respectively (WHO, 2014). Among other health challenges in Africa, most expectant mothers and women have high pregnancy-linked complications (Nnam *et al.*, 2015). During pregnancy, prenatal food intake can be affected by several factors, including educational level, social and economic status, and the mother's culture and her family's livelihood (UNICEF, 2017). Ignorance of feeding appropriate nutritional diets among expectant mothers and women was partly shown to contribute to the cases of malnutrition (WHO, 2012). The level of awareness on nutritional requirements for expectant mothers and women largely affects the behaviors and attitude in selecting nutritional foods. Therefore, research on maternal knowledge, attitudes, and practice and their correlation to the dietary intake of maternal women is essential (Mihretie, 2020)

Nutritional demands for expectant mothers and women are high, hence, sufficient required diets are seamless benefits to the health of the mother, unborn child and newly born children. This will then cater to the physiological changes (WHO, 2011) in the prenatal diet. To enhance a baby's development, a balanced diet is essential for expectant mothers and women in the prenatal and postpartum periods. In fact, healthy expectant mothers and women are at less risk of delivering underweight children (UNICEF, 2021). In Somalia, expectant mothers and women seeking better antenatal care seemed to involve formal health systems to increase the chances of safe delivery as well as proper care for the newly born child (WHO, 2016).

1.2 Statement of the problem

Among most third world countries such as Somalia, maternal nutrition before and after continues to threaten the lives of expectant mothers and women as well as that of unborn and newly born children owing to the chronic hunger crisis. Compared to other developed countries, among the third world countries, the birth rate is high whereas access to and availability of the minimal maternal nutrition diet have proven a challenge in some instances. Elsewhere, in Somalia, Lawn *et al.* (2011) reported deterioration of maternal nutrition of expectant mothers and women, however, there are several nutrition intervention programs effortlessly attempt to mitigate the situation. About 20% of African women with maternal nutrition challenges were shown to have a low BMI of $< 18.5 \text{ kg/m}^2$ during their reproductive ages (Huffman *et al.*, 2001). Additionally, according to Huffman *et al.* (2001), among African women, causes of maternal malnutrition were partly associated with high energy expenditure, inadequate food intake, micronutrient deficiency, frequent reproductive cycles and infectious diseases such as malaria and HIV. On the other hand, Guled *et al.* (2020) associated low literacy levels with an increase in malnutrition among expectant mothers and women in Somalia. In brief, despite few accessible health facilities (a potential source of nutrition knowledge) for expectant mothers and women which are far apart, they are too constrained by challenges of inadequate personnel, equipment as well as consumables. Several studies have indicated both maternal and infant morbidity and mortality owing to malnutrition among expectant mothers and women (Huffman *et al.* 2001; Shekar *et al.*, 2016; Munthali *et al.*, 2015).

1.3 Justification

The findings of this study can be used by non-governmental organizations working in Somalia to deliver better services by making evidence-based decisions during activities. The information on maternal nutrition knowledge, attitudes, and practices among pregnant women might also be helpful to the community. When food is supplied, government entities must teach health workers and nutritionists the importance of prioritizing mothers. More priority on maternal nutrition of pregnant women might be included in health worker training. The study aims to contribute toward reducing maternal death related to poor nutrition of pregnant women attending SOS hospital in Mogadishu, Somalia. Moreover, Links between various agencies, disciplines, and organizations are likely to ensure focused targeting and result in a larger impact while removing duplication of activities. Existing community structures such as self-help groups should be used as entry points wherever feasible, and community participation will be enhanced (Doocy et al., 2020). Women in developing countries are more exposed to food insecurity leading to malnutrition. These are two of the leading causes of neonatal and maternal morbidity as well as other long-term effects that can negatively affect the growth and development of the foetus. Dietary insufficiency and lack of access to enough food are considered to play a critical role in the health status of both the mother and the foetus as both under-nutrition and over-nutrition can have a serious impact on health status and life in the long term. Nutrition education focusing on girls of childbearing age and pregnant women is important in increasing their awareness of healthy pregnancy and positive birth outcomes (Napier et al., 2019).

1.4. Purpose of the study

To gather information on reasons for and possible outcomes following the inadequacy and perhaps lack of dietary knowledge among pregnant mothers and women attending SOS hospital in Mogadishu, Somalia.

1.5. Main objective

To determine maternal nutrition's Knowledge, attitude and practices and their potential outcomes during delivery among pregnant mothers and women attending SOS hospital in Mogadishu, Somalia.

1.5.1 Specific objective

1. To investigate the socioeconomic behaviour of expectant mothers and women attending SOS hospital
2. To determine the dietary status of pregnant women in SOS hospital
3. To determine the nutrition awareness, practice, and attitude of pregnant mothers and women attending SOS hospital
4. To determine the nutrition knowledge/information given to the pregnant women attending SOS hospital

1.5.2 Hypothesis

1. There is a link between the socioeconomic characteristics of pregnant mothers and women and their nutrition status
2. The dietary behaviours of pregnant mothers and women influence their nutritional status
3. Nutritional consumption awareness increased the success of delivery among pregnant mothers and women
4. High education level influence the nutritional status of pregnant mothers and women

CHAPTER TWO: LITERATURE REVIEW

2.1. Malnutrition among expectant mothers and women in developing countries

2.1.1 Nutritional behaviors of expectant mothers and women

In 2013, poor nutrition and nutrition behaviors was partly associated to claim lives of 289,000 mothers and women during their pregnancy or delivery. In most developing countries, the majority of the deaths of mothers and women were partly associated with maternal complications. Among these maternal deaths, the majority were reported in SSA followed by those in South Asia (Tamrakar *et al.*, 2021). Globally, among the maternal fatalities, 42% account for those due to complications during delivery or post-delivery (Belbase *et al.*, 2020). On the other hand, Lawn *et al.* (2011) reported 535,900 global maternal fatalities among expectant mothers and women. As a result, it is anticipated that public awareness of healthy nutrition, particularly low-fat foods fruits and vegetables among expectant mothers and women, will increase the demand for the aforementioned healthy nutrition foods. Although there are some expectant mothers and women with knowledge of the required healthy nutrition, however, among those not aware need capacity building purposely to improve their health as well as for their unborn and newly-born babies (Phelan, 2011). Several studies have shown the benefits of nutrition knowledge that are further adhered to or actionized through behavioural change on maternal diet as well as purposive supplementation of either macro- or micro-nutrients (Hassanzadeh *et al.*, 2016). Furthermore, maternal nutrition awareness has also been shown to enhance the success of deliverance among expectant mothers and women by lowering the recurrence of respiratory distress syndrome, reducing deliverance of under-weight babies (< 4kg) and minimizing hospitalization duration (Kuche *et al.*, 2015).

Nutritional necessities among women in Sub-Saharan Africa tend to be more determined by the supply of affordable resources despite other cultures limiting women's consumption of certain nutritionally and carbohydrate foods (Rahman, 2021). Financial difficulties and socioeconomic status have also been significant barriers to antenatal care for migrant women (Work *et al.*, 2013). For instance, several studies have revealed a positive association between ANC utilization and socioeconomic status (Efendi *et al.*, 2017).

In respect to Ethiopia, women with a high likelihood of utilizing ANC were associated with high incomes, singly or cojoined with the family wealth. The Association of the likelihood of women utilizing ANC with high incomes further corroborates with the study of Zhao *et al.* (2012) in China as indicated by an AOR of 1.6, elaborating an increased likelihood of using ANC with an increase in incomes, particularly among women. Other researchers have found that higher financial status positively impacts all maternity service indicators and a remarkable contribution to postpartum care. Most countries throughout the globe have implemented nutritional standards to enhance people's eating habits as they age. Nutritional guidelines are well-thought-out to be the key to any approach to promoting the feeding of wholesome foods (Montagne *et al.*, 2015). Compared to other life cycle stages, the prevalence of nutritional deficiencies due to dietary patterns and habits in pregnancy is greater during maternity.

2.1.2 Dietary patterns among pregnant mothers

Although hypothetical, some expectant mothers and women in most developing countries regulate the consumption of certain or partly starve during pregnancy purposely to minimize delivery complications. It is believed that heavy babies result from nutrition consumption or partly consumption of certain foods, potentially increasing complications associated with delivery. Thus, inadequate consumption of vital nutrients like protein, carbohydrates, vitamins C, A, and iron and

socioeconomic, environmental, and infectious variables are significant causes of maternal death, low birth weight, and prenatal development retardation (Pena *et al.*, 2012). Despite government healthcare sector development projects, it was acknowledged that the low nutritional status of women and children in Ethiopia remains a severe concern. Only a few studies had looked at the factors that influence maternal dietary behaviours in various country sections.

2.1.3 Dietary knowledge among pregnant mothers

Accessibility to nutrition information, mindset towards particular food habits and dietary practices, attendance at prenatal care, postpartum awareness, and income (Zepro, 2015) were all determined as predictors of maternal nutritional behaviours. Furthermore, meal regulations, education level, employment of head of the family, faith, maternal age, and parental status were revealed to be predictors of postpartum dietary patterns, which in turn influence expectant mothers' and women's eating patterns (Rastgoo *et al.*, 2021). Many mothers suffer from severe intermittency, low pregnancy weight growth, anaemia, other nutritional deficiencies, and illnesses such as HIV and malaria. These, together with insufficient obstetric care, lead to high rates of maternal mortality and poor birth outcomes. Maternal malnutrition reduces mothers' and women's productivity, which further results in psychological, societal and health concerns. Prenatal malnutrition is impacted by a lack of proper nutrition and social-economic variables and maternal nutritional awareness throughout pregnancy.

Most Somali women do not get enough food, in both variety and quantity, and many of these newborns and mothers are anaemic and low in vitamin A. They are also susceptible to infectious illnesses and are in danger of extreme severe malnutrition due to extremely low body weight and substantial muscular atrophy. Malnourishment has considerable economic and societal consequences. Expectant mothers and women's nutritional welfare throughout pregnancy is critical

to the health of the unborn and newly born babies as well as the health of mothers Globally, a high incidence of maternal fatalities, especially in sub-Saharan Africa, results due to few hospital facilities as well as health staffs, however, financial challenges typifies a major drawback. Infant mortality is highest in teenage females under the age of 15, and problems in pregnancy and the new birth are more significant in adolescent girls aged 10 to 19. Poor nutrition has considerable economic and societal consequences. Nutritional requirements vary depending on age, gender, and physiological factors like pregnancy.

Pregnancy is an important stage in the life of a woman that needs proper nurturing through the consumption of nutritional foods for the well-being of the fetus. A well-balanced diet is important for all to ensure optimum body system functioning, a pillar of human growth and living health over the whole life span (Shekar, 2016). Though inevitable, malnutrition increases the deterioration of newly born health and in extreme cases led to death. The health and physical implications of persistent malnourishment in infants include a delay in body development and physical growth; a reduced intellectual quotient (IQ), more behavioural issues and poor social skills; and susceptibility to illness.

During the pregnancy period among mothers and women, the success of delivery majorly depends on the associated nutrition consumption. On the other hand, maternal care is a collective incentive in ensuring the health of the unborn and the mothers as well. Elaboratively, this was shown by Henry *et al.*, (2020) that nutrition is crucial in sustaining the good health of the unborn child and the mothers. Awareness of good nutrition for expectant mothers and women has the potential of minimizing malnutrition cases that directly or indirectly affect the health of unborn or newly born children. Nutrient and energy intakes must be precisely measured during pregnancy to demonstrate

a relationship between maternal essential nutritional intakes and maternal-fetal results. Simple dietary measures, such as FFQ, were associated with the identification of particular nutrient deficits that further increase the success of delivery (Public Health Nutrition, 2013).

Intrauterine growth regression is caused by poor nutrition. Specific minerals like iodine, zinc, and foliate are also essential for fetal growth. In maternal iron deficiency anaemia, a fetal iron deficit occurs. National Nutrition Monitory Bureau (2016) showed pregnant mothers and women in Maharashtra had adequate intakes of cereals and millets, legumes, pulses and jaggery and sugar. While intake of fats and oils is over 75% of RDA, intake of dairy products is almost half of RDA, while intake of GLV is approximately 25% of the required level. Other vegetables were consumed in a wide range, with quantities falling well short of the RDA. Protein, calorie, and iron usage is adequate, while riboflavin and vitamin C intake are approximately three-fourths of RDA. The intake of vitamin A was about 50% of the recommended levels (Asha & Kumari, 2001) quotes that appropriate education and KAP in health and nutrition prevent many nutritional deficiencies among pregnant women. Dietary habits throughout pregnancy are essential. It is common in Somalia to restrict food consumption to a single meal a day in the latter two months of pregnancy to avoid difficult birthing owing to the baby's size, and this is still the case, according to the two of the discussion groups. Women also complained that their doctors had not advised them of the nutritional benefits of their pregnancy. The doctor did not mention food and nutrition unless they had hypoglycemia and as long as the fetus was developing healthily. Women, including those with hypoglycemia, were also less likely to take medicine as prescribed by their doctors. The use of natural, healthful foods without additives that were accessible in Africa was also noted by expectant and new mothers as attributed to underweight babies (Machado *et al.*, 2016). Preeclampsia is a disorder that occurs in certain expectant mothers in the second half of

pregnancies. It is estimated that 3-5% of all pregnancies are affected by preeclampsia, and had been considered the leading cause of prenatal and infant mortality and morbidity across the globe. Preeclampsia which is characterized by high blood pressure poses a risk factor to expectant mothers and women making them vulnerable owing to financial burdens, lack of awareness of nutritional diversification and the changing lifestyles within their demographics (Gonie *et al.*, 2018). The third goal among the sustainable development goals requires all countries to improve maternal health by reducing maternal mortality and achieving access to reproductive health care services (Kennedy *et al.*, 2015). Among the common causes of maternal morbidity is preeclampsia, which is mainly related to blood pressure and proteinuria. Preeclampsia usually develops after 20 weeks of gestation in women with normal blood pressure. It is among the primary causes of infant death and morbidity, affecting 2-8% of pregnancies globally and up to 10% in poor countries. The prevalence of preeclampsia in Ethiopia is predicted to be 13%. It is one of the top five causes of maternal and newborn mortality. According to the World Health Organization (WHO) and UNICEF, around 1% of women in Somalia presently utilize a contemporary method of birth control. As a result, the fertility rate of Somalia is projected to be among the highest globally, with around 6.7 children per woman. Access to various existing reproductive health treatments, including contraception, prenatal care, competent health workers, and postnatal care, is highly restricted. Abortion is strictly prohibited in Somalia and is only permitted if the life of the mother is in danger (Gonie *et al.*, 2018).

2.2 Socioeconomic factors

The social-economic describes the dominant themes emerging from the in-depth interviews with pregnant mothers and women, whereby both Upper and Lower themes are organized under the thematic categories that the research team developed, which include: Advice on Nutrition

Pregnancy Maternal Diet; Iron and Folic Acid Supplementation; Cultural Perceptions of Foods Mothers Should Consume during pregnancy. Dried seeds and fried meals were thought to impede a child's general growth and were thus avoided. Tubers cause flatulence in both the mother and the infant, therefore, their consumption is limited.

Most of these culinary habits were based on old ideas that were passed down from generation to generation. For example, some women believed that warm drinking water led the infant to have more pronounced veins, which were unsightly, thus, they preferred to drink chilly water (FSNU, 2010).

2.3 Maternal nutrition Knowledge Attitude and Practices in Somalia

A balanced diet in maternity is vital for the proper being and development of the baby. Pregnant women can obtain dietary advice from several sources, but research on the sufficiency and depth of this information is limited. A comprehensive literature investigation was carried out to determine the sources of nutritional knowledge obtained by expectant mothers, their perceived nutritional education necessities, medical professionals' perceptions of good nutrition in gestation, and the efficiency of public medical programs designed to improve dietary practices. Nutrition education was deemed vital by care providers, but obstacles to giving it to consumers included time constraints, finances, and necessary training. Several good pieces of research are required to determine the most efficient nutrition education interventions for increasing nutrition knowledge and eating behaviours among prenatal care recipients (Revelation and Science, 2016).

2.4 Nutritional status of pregnant in Somalia

Pregnant mothers' and women's nutritional health is unsatisfactory, likely due to a lack of fundamental nutrition education, incorrect cultural traditions, and a lack of food availability and

consumption. To effect changes in mothers' nutrition education, an effort is made to evaluate parents' awareness and enhance it depending on their learning requirements using an instructional module (WHO, 2015). As a result, to maintain a solid foundation and a safe future for any civilization, the health and diet of their babies must be protected.

Malnutrition has many effects on the child's development plans, negatively impacting both mental and physical development. Pregnant women were knowledgeable about nutrition and dietary categories throughout pregnancy. This insufficient nutritional awareness might be attributed to low poverty, inadequate knowledge of diet and food, and the research participants' low educational standing. Factors associated with nutritional knowledge. Although there is a general awareness of the significance of diet in pregnancy, there is a lack of understanding of familiar sources of nutrients like carbohydrates, proteins, and essential minerals and vitamins. There is also a lack of knowledge that improper diet during pregnancy can lead to miscarriage or premature birth. (WHO, 2015).

2.5 Pregnant women's nutritional awareness, attitudes, and behaviours in Somalia

Mothers' and caregivers' knowledge, attitude, and practice (KAP) on the unborn child and newly born baby feeding are crucial for optimal dietary patterns, wellness, and development. As a result, the purpose of this study is to analyze mothers' and caregivers' knowledge, attitudes, and practices regarding unborn and newly born child nutrition. An expectant woman's education and understanding of dangerous indications during pregnancy is critical in seeking prompt care and reducing the repercussions of 'first delay' in seeking care following obstetric problems (BMC Public Health, 2011).

Women's capability to remember harmful signs has been examined in studies in different situations. Although recall demonstrates that a woman has heard of danger warnings, her

interpretation of the danger indications determines what action she would take in an emergency. We tested pregnant women's awareness of obstetric danger signs by testing their capacity to recall warning signs as well as their grasp of what to do in the event of an obstetric emergency (Bereka *et al.*, 2017). Food and nutrition interventions must be designed and evaluated using accurate measures of food and nutrition security. Many strategies for assessing food security and nutrition results have been presented in the research, and different perspectives can lead to inconsistent policy and program impacts. The articles in this special issue analyze and evaluate a set of possible indicators used to measure food and nutrition security to understand their similarities and differences and describe how these measures have been used to evaluate various policies and programs. The main issues acknowledged in these publications include alternative indicator harmonization and the most effective ways to use food and nutrition security measures to create policy (Martin-Canavate *et al.*, 2020).

2.6 Research gap

Past research on the role of Knowledge, attitude and practice of prenatal diet among expectant women attending the SOS hospital was done. In conducting the literature review, no previous research was linked to knowledge, attitude and practice of maternal nutrition among pregnant women in SOS hospital at Heliawa district in Mogadishu-Somalia.

2.7 The Conceptual Framework

The dietary status of expectant women is dependent on several factors, which include socio-demographic. This economic situation, in turn, influences food variety and frequency of consumption, and hence nutritional status. Knowledge attitude and practice and Anthropometric measurements reflect the nutritional status of pregnant mothers and women.

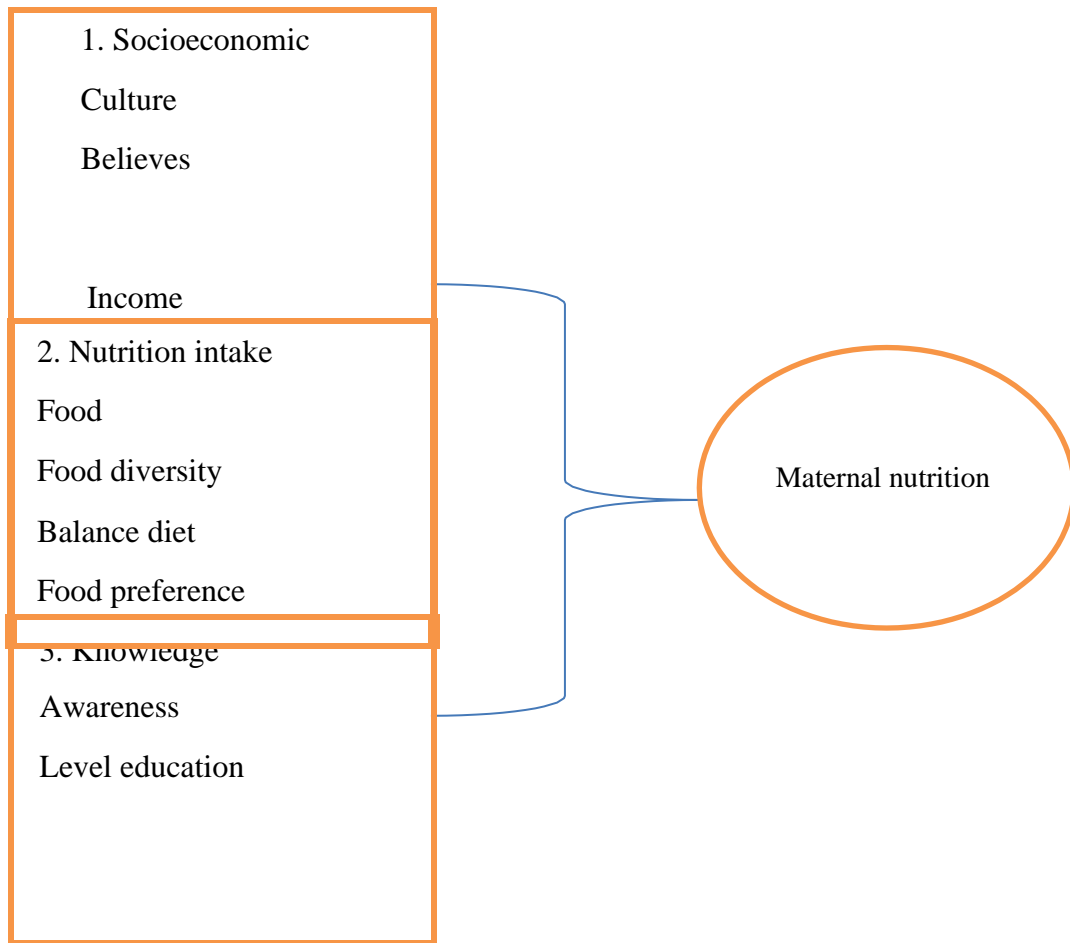


Figure 2.1: Conceptual framework for the study

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Study Design

A cross-sectional survey was conducted to assess nutrition knowledge, attitude and practice for pregnant mothers and women attending SOS hospital – Somalia. In this study, both quantitative and qualitative data were gathered to explore demographic, socio-economic and nutrition characteristics among pregnant mothers and women.

3.1.2 Study Area

This study was conducted in SOS hospital in Heliwa district, Mogadishu, Somalia. Heliwa District is among the 17 districts in Mogadishu City. It is located in the northern part of the capital of Mogadishu. Heliwa borders three other districts; Karan south, Yaqshid to the west and Bal ‘ad town of the middle Shebelle region to the north (The Directorate of National Statistics, Ministry of Planning, Investment and Economic Development and Somalia., 2020). It started in 1981 when people began to settle in the district. In 1988, Heliwa was formally designated as a separated district in the public bulletin by Siyad Barre’s government and was named “Heliwa.” Heliwa has an approximate land area of 5km² With a population of about 145,740 people (UNFPA population Estimation survey, 2014).

Globally, malnutrition cases measured as poor anthropometric status, partly account for 50% of deaths among children (Rice *et al.*, 2000). In Somalia, most infants are chronically affected by hunger which increased the cases of malnutrition. Following the establishment of the SOS Medical Centre (Mother and Child Clinic) in 1989, it had expanded to cater for 26 admission beds, 19 patient examination rooms, an obstetrics ward, an operation theatre, a pediatric wing, several laboratories and a blood bank. Equipped operation theatre as supplemented with other wings and

wards, mainly serves cesarean-section procedures and other minor surgeries. Fortunately, the hospital delivers an average of 15 babies each day. On the other hand, SOS Health Centre serve about 30,000 patients per year.



3.1 : Map showing study area of Huriwa District, Mogadishu, Somalia

3.1.3 Study population

The eligible study population included all women who attended SOS Hospital Mogadishu medical centres for prenatal treatment between July and August 2020.

3.2 Ethical considerations

Ethical clearance will be got from the ethics committee of SOS Hospital and the University of Nairobi. Permission will also be sought from the Ministry of Health Office and the Hospital Administration; written informed consent will be drawn from study participants. All persons to be interviewed will give signed and verbal informed consent. All findings and respondent information

or answers will be treated as confidential. There will be no potential that the results could be damaging to the community. The community will be informed of the study results and get a final copy of the thesis through the relevant administrators. The research assistant will handle anthropometric measurements concerning the participants.

3.3 Inclusion criteria

1. Qualified candidates were:
2. Pregnant mothers and women attending SOS hospital 4 Women who are healthy and do not have other medical or food requirements
3. All consented pregnant mothers and women were considered in the study

3.4 Exclusion criteria

1. Pregnancy women with a chronic condition that may affect nutrition status

3.5 Sample size determination

This study interviewed 384 participants following the sample size method described by Lemeshow *et al.* (1990).

$$N = \frac{Z^2 * (1 - a) * P (1 - P)}{d^2}$$

Where Z= standard normal distribution curve value for 95% CI which is represented by 1.96,

P= estimation of women with childbirth complications (0.5), d= absolute precision (0.05).

3.5.1 Sampling procedure

In this study, the SOS Hospital in Hilwa District, Mogadishu city of Somalia was purposively selected whereas the participants in the study were determined based on a systemic random sampling technique (Figure 2). Systematic random sampling is a probabilistic sampling approach in which the participants are randomly drawn from a more significant population and at defined periodic intervals. The interval sampling is determined by dividing the size of the population by the intended sample size.

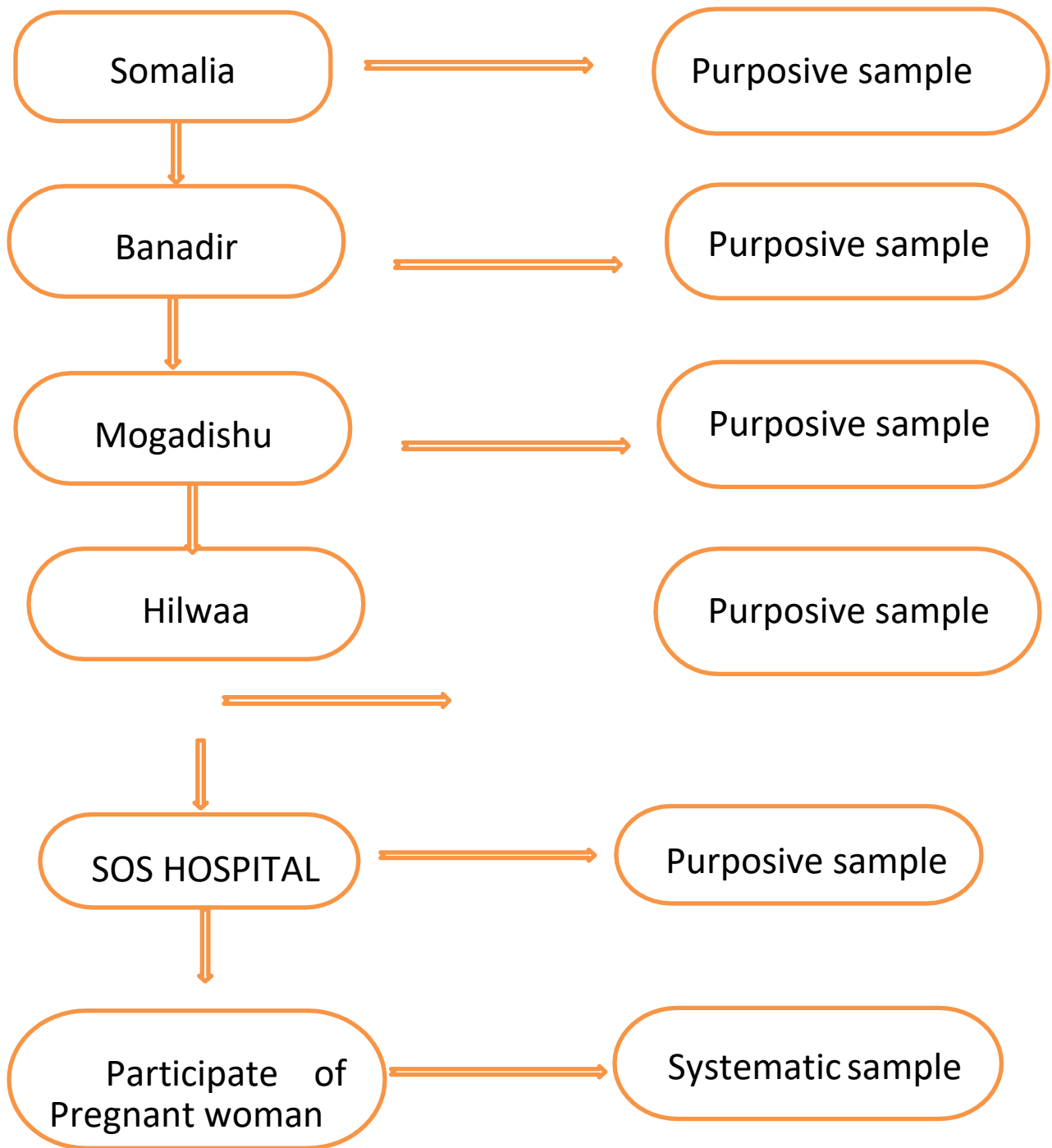


Figure 2: Schematic Diagram Showing Sampling Procedure

3.6 Data collection tools and procedures

A semi-structured questionnaire written in Somalia language; a common local language was used as a data collection tool. The semi-structured questionnaire had the following sections:

- I. Socioeconomic status of pregnant women in SOS Hospital
- II. Nutritional status of pregnant women in SOS Hospital
- III. Knowledge, Attitude and Practices of maternal nutrition among expectant mothers and women

3.6.1 Socio-demographic data

A face-to-face interview with the participants will be adopted to gather information. However, the administration of the semi-structured questionnaire was preceded by consent from each participant

3.6.2. Nutrition status

All recruited study participants had their anthropometric measurements are taken, which included weight, height and MUAC (Mirwald *et al.*, 2002). Weight: Pregnant women may experience major changes in their bodies and their everyday habits of women. Weight: Pregnancy can cause significant changes in women's bodies and everyday activities.

Weight of women: In this category, the weights were taken before meals and after emptying the bladder.

Age: Age was confirmed from the birth certificate, clinic card, baptism card, or ID.

Height: At each session, take a tape measure and calculate the length from the pelvic bone, up over your bump, up to the top of your uterus. This measurement, known as the fundal height, is

used to determine the size of your baby. Without a height board, modified tape measures measuring up to 2m were used with an accuracy of 0.1mm as described by Gibson (2015) to determine the height of the participants.

MUAC: Mid Upper Arm Circumference normal is greater than <18.5, underweight is 18.5-24.9,normal is 25.0- 29.9,overweight is>30.

3.6.3 Nutritional knowledge, attitude, and practices

Each pregnant mother or woman was interviewed on her level of knowledge, attitude, and practice, as well as the source of nutrition information. This includes food intake, maintaining a good diet and a nutritious diet throughout pregnancy is crucial for the mother's and unborn child's health. Nutrition counselling and awareness is a popular method of enhancing women's nutrition through pregnancy. The method emphasizes a healthy balanced diet by increasing adequate protein and calorie consumption while encouraging the regular and sustained use of micronutrient additives, food supplements, or food supplements.

Pregnant women's dietary demands will rise throughout pregnancy. Nutrition to the fetus, congenital anomalies, growth retardation, premature labors, specific genetic abnormalities, and pregnancy complications are all factors to consider. Anemic and prolonged pregnancies are common maternal nutritional problems. Hemorrhage and eclampsia are two of the most common causes of maternal death. Expectant mothers should pay closer attention to their dietary intake since they must fulfil their own nutritional needs and the fetuses. The mother's attitude and behaviors in selecting food and regulating her diet will be influenced by her level of understanding of nutritional demands throughout pregnancy. As a result, more study on the correlation between expectant mothers' and women's knowledge and attitudes and their nutritional health is required.

3.6.4 SOS Hospital recruitment and training of research assistants

3.6.4.1 Training of the research assistants

Before conducting the survey, a 5-day training was conducted on the enumerators to familiarize themselves with the semi-structured questionnaire and also pre-test it to gauge time and any forthcoming adjustments. Additionally, at least two health practitioners from the SOS Hospital were included for intercepting some medical challenges during the survey.

3.6.5 Data Quality Control

Validation of the questionnaire was conducted through pre-tasting conducted in RI MCH in Hilwa district to ensure validity and reliability. This procedure further catered for adjustments in the semi-structured questionnaire as well as during the face-to-face interview.

3.7 Statistical data analysis plan

The processed data from the survey were analyzed using Statistical Package for Social Scientists (SPSS version 20.0 and ENA).

CHAPTER FOUR: RESULTS

4.1 Demographic information of pregnant women attending SOS Hospital

Among the participants who attended SOS Hospital in Heliwa District, Mogadishu city of Somalia had a significant difference in marital status. For instance, the majority of pregnant mothers and women (77.9%) in the study were married whereas less than 30% were either widowed or divorced. On the other hand, Similarly, among the study participants, there was significance ($p < 0.01$) in the occupations cadres. In this regard, over half of the participants were unemployed. However, among those employed, fortunately, 26.3% and 17.4% were self-employed and in formal employment, respectively. Although the level of education had no significant difference, most participants had secondary education (25.3%) and informal education (23.5%) (Table 4.1).

Table 4.1 Demographic characteristics of pregnant women attending SOS Hospital

Demographic characteristics of the study population	Percentage N=384	p-Value
Divorced	9.9	
Married	77.9	0.02
Widowed	12.2	
Occupation		
Employed	17.4	
Self Employed	26.3	0.01
Unemployed	56.3	
Level of Education		
Elementary	4.7	
University	15.4	
Informal Education	23.5	0.12
No Education	15.4	
Secondary education	25.3	
Primary Education	15.7	

4.2 Pregnancy history of women attending SOS Hospital

Among the participants interviewed, none delivered twins. Though all the participants had at least attended antenatal clinics (ANC), the frequency of visits averaged 2.44 ± 0.497 trips. This study had significantly ($p < 0.05$) highest participants who reported being diagnosed with anemia (45.3%) whereas Diabetes (12.5%) and hypertension (5.5%) came second and third, respectively. However, 36.7% of the participants reported no diagnosis of any diseases. During the study period, associated medical conditions significantly differed whereby the majority of about 70% had medical conditions compared to 33.3% that reported none. Categorically, among the reported medical conditions were morning sickness (28.1%), Heartburn (13.8%), and constipation (12.5%). The others that each had less than 6% were anaemia, diabetes mellitus, and gastrointestinal discomfort. There was a significant difference in responses given by the study population when the researchers inquired whether they had experienced the following specific symptoms during their pregnancy: 36.5% had suffered severe headaches, 21.6% abdominal pain, fever 15.9%, blurred vision 11.5% suffered persistent vomiting 7.3%. A total of 1.1% of the respondents reported bleeding in the vagina, hand, and facial swelling (**Table 4.1**).

Table 4.2 Maternal history of pregnant mothers and women who attended SOS Hospital

	Percentage N=384	p. value
Ever had abortion	6.3	
Twins pregnant were born	100.0	0.079
Attendance of ANC	100.0	0.002
History of illness		
Anemia	45.3	0.002
Diabetes	12.5	
Hypertension	5.5	
Normal women	36.7	
experience any_ of the following conditions		
Anaemia	5.5	
Constipation	12.5	
Diabetes mellitus	3.9	
Gastro intestinal discomfort	2.9	
Heartburn	13.8	
morning sickness	28.1	
None	33.3	0.002
Do you have symptoms during pregnancy		
bleeding from the vagina	0.8	
blurred vision	11.5	
Dizziness	6.3	
Fever	15.9	
Abdominal pain	21.6	0.000
persistent vomiting	7.3	
severe headaches	36.5	
sudden swelling of the hands or face	0.3	

4.3 Nutrition Knowledge of pregnant women attending SOS Hospital

The majority of the women knew sources of vitamins (88.3%), followed by those identified sources of carbohydrates (69.3%), and half of the women (54.7%) knew sources of proteins. Most women could not identify sources of energy as only 22.3% could. Only 14.6% of the women knew that foods could provide more than one kind of nutrient. Less than 10% of the women (8.9%) knew that HIV infection does not result in poor nutrition, while 6.8% knew the functions of protein-rich foods. All the responses to nutrition knowledge were significantly different ($p < 0.05$) except for the source of energy component.

Table 4.3 Nutrition Knowledge of pregnant women attending SOS Hospital.

	Percentage	P= value
	N=384	
Energy	22.3	0.066
Protein	54.7	0.000
Carbohydrates	69.3	0.000
Vitamins	88.3	0.007
Nutrients cannot be provided by just one kind of food	14.6	0.007
Protein-rich is food is needed to build and repair body tissues	6.8	0.010
HIV infection is a result of poor nutrition	8.9	0.010

4.4 Nutritional attitude of pregnant women attending SOS hospital

The attitude towards whether hygiene was important was significantly different among pregnant mothers and women. Half of the pregnant mothers and women (50.5%) agreed that hygiene is essential, while the same number strongly agreed (49.0). About 65.1 % of the pregnant women decided that a mother must prepare a balanced meal, while 29.7% strongly agreed (Table 4.4).

Table 4.4 nutritional attitude of pregnant women attending SOS Hospital

	Percentage	p. value
N=384		
Hygiene is important		
Strongly disagree	0.5	
Agree	50.5	
Strongly agree	49.0	0.007
Mothers need to know about preparing a balanced meal		
Disagree	5.2	
Agree	65.1	0.047
Strongly agree	29.7	

4.5 Nutritional practices of pregnant women attending SOS hospital

The mean number of additional meals taken by pregnant mothers and women in the study population (82.6%) was 3.30 ± 0.459 . On being asked when a pregnant mother or woman should start going to the antenatal clinic, the majority (86.1%) stated, 4.90 ± 2.0222 into the pregnancy with a minimum of one month (expressed by some pregnant women), and the maximum is 9.0 (stated by some pregnant women). About 62.5% consumed snacks in between meals. While the majority (85.7%) believed taking drugs in pregnancy was dangerous to the fetus (the drugs referred to, among others, are anti-malaria drugs, Panadol, anti-diarrhea drugs, deformeders) and a similar

proportion (85.9%) of the study population stated that attending clinics decreased pregnancy complication during the antenatal and postnatal period. Most of the pregnant women (89.8%) noted that coffee and teas should not be consumed during the pregnancy period.

Table 4.5 Nutritional practices of pregnant women attending SOS hospital

N=384	Percentage	p-value
Reasons of avoiding	54.9	0.095
skip meals	100.0	0.095
Take additional meals during pregnancy compared to before the pregnancy	82.6	0.000
Consume snacks between meals	62.5	0.000
Believe is drugs intake during harmful to the Foetus	85.7	0.020
Follow up during pregnancy decreases antenatal and postnatal complication	85.9	0.020
Is it Importance to take folic acid during pregnancy	91.7	0.000
Consume tea or coffee	89.8	0.000

4.6 Nutrition Knowledge /information given by pregnant women attending SOS hospital

All the pregnant women (100.0%) knew that a balanced diet is essential during pregnancy, and slightly less than a third (28.0%) did not know about foods that are rich sources of Iron.

Table 4.6: Nutrition Knowledge /information given to pregnant women attending SOS hospital.

	Percentage	p. value
	N=384	
A balanced diet is essential during pregnancy	100	0.000
Which of these sources of iron	28.0	0.124
In pregnancy, a woman needs more folic acid and iron	2.2	0.124
Nutritional deficiency during gestation may have an impact on the health of both the baby and the mother	98.7	0.112
Which of these is a dietary source of vitamin C	66.7	0.001
Which of these is a source of vitamin B12	38.4	0.001
Which of these is a source of vitamin D	25.8	0.174
Is it not essential to take fiber during pregnancy	80.5	0.174

4.7 Blood pressure Status physiological of pregnant women attending SOS hospital

The blood pressure during pregnancy revealed that 28.9% had systolic blood pressure (BP) above 120, yet very few pregnant women (0.8%) had diastolic pressure greater than 80. The mean diastolic blood pressure was 74.487 ± 5.7661 , and the systolic means was 113.83 ± 6.247 . The mean weight of pregnant women was $71.308 \text{ Kg} \pm 8.5656 \text{ Kg}$. There was a weak relationship between pregnant women's blood pressure and their body weight (systolic $r = 0.031$ $p = 0.544$) Diastolic ($r = 0.089$ $p = 0.096$). However, the change was statistically insignificant.

Table 4.7 Blood pressure Status physiological of pregnant women attending SOS hospital

Systolic group	Percentage		P- value
	N=384		
Normal	28.9		
Not normal	71.1		0.000
Diastolic grouped			
Normal	99.2		0.000
Not normal	0.8		

	Mean	Std. Deviation	N	
Weight of the participant hospital record	71.308	8.5656	384	0.096
Systolic blood pressure	113.83	6.247	384	
Diastolic blood pressure	74.487	5.7661	384	

4.8 Focused Group discussion

4.8.1 Knowledge on high blood pressure

In a Focused Group discussion, respondents were asked about their understanding of High Blood Pressure in SOS hospital. The pregnant women in the research sample were aware of hypertension and could describe it in their terms. When the heart rate (the pressure of the blood pressing against the blood vessel walls) is continuously extremely high, you have hypertension (High Blood Pressure). They were all in agreement that blood pressure is measured with two values. The systolic pressure (higher amount) indicates the power with which the heart circulates blood throughout your body. The resistance to blood circulation in the blood arteries is measured by diastolic bp (lower amount). "Hypertension (high blood pressure) is a frequent disorder in which

the long-term force of the blood on your artery walls is high that it can eventually result in health issues," stated one reply.

4.8.2 Importance of attending antenatal clinics in Somalia

One enrolled nurse respondent stated that it is essential for pregnant mothers to go for antenatal. Antenatal visits allow your GP, obstetrician, and other members of your care team to assist you and the child to remain healthy.

"Even if the pregnancy is doing well and you're doing well, it's crucial for you to have the visits so that any possible hazards may be discovered and addressed, or reduced," the pregnant ladies unanimously agreed. They went on to say that it's also a great time to address any concerns you have had about your pregnancy, such as what's occurring during each phase, physical pregnancy signs, and the actual birth. You can wish to inquire regarding the baby's care postpartum period. A young leader in the organization stated that you might also obtain help with the lifestyle, such as psychological health or nutritional guidance, or help to quit smoking or avoid alcohol. The reply might also talk about any troubles you're facing at home.

4.8.3 The group agreed on the following point

It was possible to obtain correct nutritional information. The diet will need to be modified to satisfy the fetus's dietary demands. The doctor offers you detailed instructions on your suggested food intake for the following nine months, such as what you should and should not consume. Contrary to common perception, being pregnant does not entitle you to eat for two (sorry!). In reality, a single newborn requires just roughly 350 additional calories each day. All of this and more is delivered at your antenatal sessions.' It was suggested that they maintain a record of your child's progress. The baby's development is a vital sign of how well it does in the womb.

4.8.4 What the respondents stated about the care given at the antenatal clinic

The doctor will measure your belly from the sternum to the tip of the pubic bone throughout your sessions. These measures allow the doctor to monitor the growing fetus. Ultrasounds will be scheduled carefully to confirm the gender of the baby and development (for those who could afford ultrasound).

Plan proper testing: Your Obstetrician-Gynecologist (OB/GYN) may order specific tests depending on age, medical records, and family medical history. During the second trimester, for example, amniocentesis is performed. It is mainly used to screen for genetic defects such as Down syndrome, monitor the baby's health if you have Rh sensitization (when your kid has a different blood type than you), or confirm the infant's lungs' development.

It is up to the individual and their partners to educate themselves about pregnancy and delivery and devise a postpartum strategy. Maternal checkups allow them to address multiple diagnostic treatments that are important to them and hypothetical scenarios, queries, and issues with the doctor. In addition, they are studying the dangers and advantages of each intervention or therapy option accessible to them. The mother and the child need the most caring and knowledgeable possible care for their survival to guarantee a good outcome.

4.8.5 High Blood pressure and the development of the fetus for pregnant women attending SOS hospital

4851 One respondent stated:

“Blood flow to the placenta is reduced. Your baby may get insufficient oxygen and nutrients if the placenta does not receive sufficient blood. Slow development (intrauterine growth restriction), low birth weight, or early birth can all result from this. Prematurity can cause respiratory difficulties, higher infection risk, and other consequences for the newborn.” This is what the group had to say

about congenital malformations. Preeclampsia raises the chance of this complication, wherein the placenta rips from the internal uterine wall before birth. Acute abruption can result in significant bleeding, which can be fatal for both the respondent and their baby. The baby's development can be retarded or obstructed as a result of high blood pressure. If hypertension is not well managed, it might harm the respondent's other organs (the brain, heart, lungs, kidneys, liver, and other major organs). It is potentially deadly in adverse circumstances.

4852 Respondents agreed on the following:

“High blood pressure leads to premature birth. When a woman has hypertension during gestation, an early birth may be required to avoid potentially serious problems. Preeclampsia may raise your chance of developing heart-related (cardiovascular) illness in the future. If you've experienced preeclampsia once or even had a preterm delivery due to increased hypertension during gestation, the risk of future heart disease is increased. A mother of three said that high blood pressure could lead to Preeclampsia. Symptoms of preeclampsia lead to severe headaches, poor vision, and protein in the urine. The participants agreed that high blood pressure is a risk factor for gestational diabetes, a kind of diabetes that only affects expecting mothers. It is a disorder wherein the system has an excess of sugar. The majority of women are tested for gestational diabetes between 24 and 28 weeks of gestation. Kidney failure: It happens when the kidneys cease to function properly, allowing waste to accumulate in the system. Placental abortion: When this occurs, the fetus may not receive sufficient oxygen and nutrition while in the womb. Severe vaginal bleeding is another possibility. The placenta's role is to provide nourishment and oxygen to the infant via the umbilical cord.

4.8.6 Postpartum hemorrhage

The pregnant women responded that this occurs when women suffer postpartum hemorrhage. It happens mostly a day after delivery or up to 12 weeks. Edema of the lungs: This occurs when fluid occupies the lungs, causing respiratory distress. A stroke occurs when a blood clot obstructs a blood artery bringing blood flow to the brain or when a blood vessel within the brain breaks (blood flow to your brain stops).

Pregnancy-related mortality: This occurs when a woman passes in her pregnancy or within a year after the conclusion of her pregnancy as a result of pregnancy-related health complications. You are more likely to have a cesarean delivery if you have high blood pressure throughout pregnancy. This is a surgical procedure in which the kid is delivered via an incision made in the abdomen and uterus by the obstetrician. One male respondent said that the fetus is affected by high blood pressure the expectant women in Somalia. He said it could lead to premature delivery. This is premature birth, occurring before 37 completed weeks of gestation. Even with medication, an expectant woman with high blood pressure or preeclampsia might have to deliver a baby prematurely to avert catastrophic health concerns for her and her baby." He went on to say that intrauterine growth constriction occurs when elevated blood pressure causes blood vessels in the umbilical cord to constrict. It transports nutrients and oxygen from the placenta to the infant. If you have hypertension, the kid may not receive adequate oxygen and nutrients, leading him to grow very slowly or poorly. A one-year breastfeeding mother said that blood pressure could lead to low delivery weight. This occurs when the born baby weighs below 5 pounds, 8 ounces. She went on to say that blood pressure could lead to fetal death.

4.8.7 Importance of eating nutritious foods during pregnancy for the fetus growth in Somalia

One respondent said;

Proper nutrition is an important part of having a healthy child and living a healthy lifestyle; fetal development happens throughout the first few weeks of gestation, while many women may still not know they are expectant. Before pregnancy, dietary modifications must be tailored to your specific medical situation, weight, and eating habits.

A community health worker said that maintaining a nutritious diet before conception is also critical since the baby's continued development is dependent on the health of the embryo from which it is produced. The source then implants in the uterine (womb) wall of the woman. More cells are likely to form the placenta than the fetus in undernourished women, which means the fetus will be relatively tiny when it begins growing and its development in the womb will be limited. This raises the probability that the baby may be born too tiny (weighing less than 2.5kg). A prenatal dietary condition during maternity is more important in influencing fetal health and susceptibility to certain disorders. Fetal health is influenced by factors related to the recipient woman (the woman carrying the kid).

4.8.8 Whether pregnant mothers need to know the importance of attending the antenatal clinic, a Village

The health worker in the group stated to schedule your first prenatal checkup as soon as you suspect you're pregnant. Make time at your initial appointment to go through your medical history and discuss any risk factors for pregnancy difficulties. The pregnant lady is examined and treated for any disorders that might endanger her pregnancy, such as anaemia, malaria, STDs, and HIV/AIDS. The pregnant woman's blood pressure, blood, urine, baby's position, and weight are all checked. The expectant woman is given information to help her get a healthy pregnancy and delivery, such

as counselling on the best foods to consume, preventing HIV/AIDS and STDs, preparing for a safe birth, preparing for the infant and nursing. The unborn baby is examined to ensure that it is growing normally. The pregnant mother receives two (2) Tetanus vaccines to protect her unborn child from Tetanus." One pregnant mother said that; One of the most important nutrients during pregnancy is iron.

When a mother's iron levels are low, she may feel weary and dizzy. Iron-rich foods include meat, fish, and eggs. Iron supplements are found in the maternity clinic, many pharmacies, and many supermarket stores if the iron in the meal is insufficient to meet the required daily amount.

Folic acid is critical to the growth of a healthy child, especially in the first 28 days following conception; however, you may still not know you are pregnant until after 28 days. As a result, your folic acid consumption should start before pregnancy and maintain throughout the pregnancy. Your doctor or obstetrician will advise you on the proper amount of folic acid to take for your specific needs. Folic acid may be found in leafy green vegetables, brown rice, and granary bread. Both pregnant women and women attempting to conceive should consume lots of these nutrients. However, the only way to be sure you're getting enough is to take a supplement.

CHAPTER FIVE: DISCUSSION

5.1 Demographic information of expectant women attending SOS Hospital

From this study, the majority of the pregnant mother and women were married which typifies family and marriage as upheld by the Islamic culture which is dominant within Somalia. Similarly, a study by Sadia (2020) and Alexander *et al.* (2021) had almost half of the participants being married. Furthermore, the National Center on Cultural and Linguistic Responsiveness, (2012) had associated a lot of marriage within Somalia with highly influenced by the Daynile's Islamic culture, which encourages women to marry and disdains divorce. On the other hand, this study showed low levels of education especially among women as partly indicated among the pregnant mothers and women within Heliwaa District. This study's findings were similar to those of Abdi (2020) whereby the respondents from Daynile District, Mogadishu – Somalia had low levels of education. According to ARC (2018) and UNHCR (2016), there were high levels of unemployment, poor education, and severe poverty rates in the Somali nation that partly contribute to malnutrition among pregnant mothers and women. Although this study too revealed high levels of unemployment and low levels of education among pregnant mothers and women, a study by Islam *et al.* (2016) further linked cases of underweight infants to low levels of education and unemployment among pregnant mothers and women. Furthermore, the research revealed a link between mother nutrition awareness, maternal educational status, and maternal results. This suggests that mothers and caregivers with low levels of formal education and without employment had considerably inadequate nutrition education (Kamau *et al.*, 2019).

The majority of the respondents visited Antenatal Clinic with an average frequency of below five times. A study in Borama, Somalia, on the utilization of ANC found that about 51.7% of the women attended the recommended four visits (Mouhoumed *et al.* 2021). This is a prevalent

finding, as the WHO recommends at least four ANC visits for pregnant women (WHO, 2020). ANC visits are considered to be of great importance because through the care provided at the antenatal clinics, pregnancy-related complications are prevented or treated (Mouhoumed and Mehmet, 2021)

5.2 Morbidity prevalence of pregnant women attending SOS Hospital

Anaemia was the most prevalent disease among pregnant mothers and women. The high prevalence of anaemia in Somalia is not a new trend as it was reported that 63.8% of pregnant women in rural areas are suffering from iron-deficiency anaemia (Bereka *et al.*, 2017). Anaemia was prevalent in 84.3% of pregnancies in research conducted in the Heliwa District of Somalia. WHO reported findings rating the prevalence of anaemia at 40% worldwide, with more than half a million maternal deaths being reported due to postpartum complications (Osman *et al.*, 2020). Morbidity conditions were shown to be mitigated through cultural, societal, and personal influences (Lange *et al.*, 2019). Handling morbidity conditions during pregnancy can result in a long-term effect on the mother's life and determine the pregnancy outcome (Kiboi *et al.*, 2016).

5.3 Nutrition Knowledge of pregnant women attending SOS Hospital

This study revealed the pregnant mothers' and women's dietary knowledge of the nutrients foods sources in Somalia. All the study participants were knowledgeable about the various sources of vitamins. The majority knew about sources of carbohydrates, whereas more than half could identify at least one type of protein-energy source. Liang *et al.* (2018) discovered a relationship between nutritional knowledge and nutrition intake. This is because dietary diversity is interlinked with the awareness of the dietary composition of a food group and the body's nutritional needs. The respondents had low knowledge of appropriate diets since only a few could identify food types

that provide more than one nutrient. Although all the informants claimed to know the importance of a balanced diet in maintaining good health during pregnancy, a few of them were not well informed on the constituents of a balanced diet, nor did they know about the adverse impact on health caused by lack of essential nutrients including vitamin C, vitamin D, fiber, and vitamin B12. These results are not possible to externally validate since there were hardly any studies with similar results. According to WHO, healthcare practitioners should give pregnant women precise, sufficient, and appropriate nutrition-related advice during each ANC visit. This guidance not only improves dietary practice but also boosts the chances of a positive birth outcome of the pregnancy (Zelalem *et al.*, 2017)

5.4 Nutritional practices and attitudes of pregnant women attending SOS Hospital in Somalia

The majority of the pregnant mothers reported taking at least three additional meals on top of the standard three meals per day. These other meals are commonly referred to as snacks. Research in one of the refugee camps in Somalia found a high intake of snacks among female participants (Dharod, 2011). Consumption of these snacks between meals is vital in optimizing dietary intake of macronutrients and supplementing the body with important nutritional components such as zinc, iron, selenium, folate, vitamin A and iodine (Stråvik *et al.*, 2019).

Some of these micronutrients help in preventing adverse effects resulting in deficiencies in the body. In addition to their contribution to the role mentioned above, some nutrients are essential in fetal brain development and cognitive functions (Githanga *et al.*, 2019). Intake of Pastoral societies relies on milk, whereas farmers eat mainly legumes, vegetables (such as tomatoes and onions), and fruit (influenced by seasonality). However, urban families have greater access to more vegetables as evidenced by the research findings, protecting expectant mothers and women from

the risk of premature birth (Nkwemu *et al.*,2021). Apart from the nutritional intake, most women believe that it is wrong to take some medications when one is pregnant due to their perceived assumptions that it would cause harm to the fetus. These medications include but are not limited to, anti-malarial drugs, Panadol, anti-diarrheal, and deformers. There was no study in Somalia on pregnant women self-medicating but a study in Addis Ababa, Ethiopia, found that 71.4% of pregnant women self-medicated on modern medicine (without prescription) from pharmacies or drug shops (Kidanemariam *et al.*, 2018).

Pregnant mothers' and women's perceptions of medications are associated with a lack of ability to articulate specific adverse outcomes from these drugs rather than their lack of awareness of the risks associated with the medicines (Lynch *et al.*, 2018). The majority of the mothers believed that antenatal clinic visits decreased pregnancy complications. This is a reasonable belief since antenatal visits provide practical care regarding disease diagnosis, check-ups, and possible treatment (Zelalem *et al.*, 2017). It is a combination of health-seeking and help-seeking behavioural approaches.

Hygiene practice was not considered an essential determinant of maternal health as only half of the study respondents strongly agreed with the importance of basic sanitation measures. However, almost the same number of respondents believed that it is essential to maintain a clean environment. Contrary to the beliefs of the respondents, WHO, UNICEF, and UNFPA state that 90% of the maternal deaths that occur in Africa and Asia can be prevented by establishing proper systems of household hygiene, and cleanliness (Songa and Rakuom, 2015)

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Findings from the research showed that the high prevalence of unemployment among women is a key determinant in poor nutritional intake among pregnant mothers and women. The average education level is elementary school, signifying that education among women is still deficient in the region. Low levels of antenatal clinic attendance among pregnant mothers and women are still a bottleneck in achieving WHO goals of maternal nutrition care. This is because regular ANC visits are a platform for information dissemination on maternal dietary behaviours. However, most pregnant mothers and women were well aware of the appropriate nutritional behaviours during pregnancy. The major challenges to their implementation relied on food security. On non-nutritional behaviours, pregnant mothers and women perceive medication intake as detrimental to their pregnancies since it is likely to affect fetal health. They also believe that attending antenatal clinics decreases pregnancy-related complications.

6.2 Recommendations

The study recommends that:

1. Nutritional education is institutionalized, mainly where health education is provided at each contact center in hospitals and other health centers.
2. The government to do more sensitization to create awareness of the importance of early and regular attendance at antenatal clinics. This can be achieved by utilizing local channels such as local community political leaders, religious leaders, and regional administrative offices.
3. The government to do more on supplementation programmers, especially for the iron-deficient pregnant mothers. Legislation of policies to guide these supplementation programs.

4. More input by researchers and stakeholders should be initiated through research on the role of religion on dietary intake among pregnant women.
5. Healthcare workers should always encourage pregnant women to seek advice from the appropriate health personnel before taking any supplements.

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