Child Care Practices and Nutritional Status Effect of Child Care Practices on Nutritional Status of Children 0-5 Years Old in Borama Town, Somaliland

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ABSTRACT

The study investigated the effect of child care practice on nutritional status of children 0-5 years old in Borama town, Somaliland. Child care practices are complex set of behaviors that range from child feeding practices to responses that promote a safe and healthy environment for the child, nutritional status is a status which is determined by a child's health after physical examination and anthropometric measurements. Globally in 2015, about 7.7% of children were wasted, 24.5% were stunted and 15% were underweight. The African region and South-East Asia have reported the highest prevalence of under nutrition, with the former accounting for about 39.4% of the stunted, 24.9% of the underweight and 10.3% of the wasted children below 5 years of age. In Somaliland, the prevalence of moderate acute malnutrition among children 0-5 years old suddenly increasing. It increased from 21.9% in2016 to 34% in 2017, and 44.8% in 2018.In Borama town, the proportion of moderately malnourished children increased from23% in 2016 to 37.3% in 2017 and from 37.3% to 44.8% in 2018 .This reflects a general increase of 33.3% in 3 years, or an increase 11.1% per year in moderate acute malnutrition, which has resulted in increased cases of death among children under five years within the study area by 0.5% in 2016 to over 2% in 2018 Guided by the theory of Health Belief Model developed by Ronsen stock in 1950.The study used cross-sectional survey design .The study used stratified, simple random and purposive sampling methods; on sample of 196 children attending four MCHs in Borama town on February 2019 The study found that sanitation significantly decrease the odds of child developing malnutrition within the study area by 26%, OR= .074 confidence interval of 1.011-1.142, p= 0.021.the study also found that socioeconomic characteristics of the mother insignificantly increase the odds of child developing malnutrition within the study area by 1.1%, OR= 1.011, confidence interval, 0.992-1.029, p= 0.260. Furthermore, the study found that feeding practices significantly decrease the odds of child developing malnutrition in the study area by 7%, OR= 0.930, 95% confidence interval of 1.004-1.084, p=.031. First the researcher recommends that ministry of health should increase community awareness of importance of sanitation and encouraging the community weekly campaign of garbage collection from the different parts of the town. Ministry of health together with nongovernmental health organizations should plan training on promoting knowledge, attitude and practices of mothers on proper disposal household refuses. Secondly the researcher also recommends that the policy by the government should be enacted to allow working mothers to have more time to care their children. The government should also create a policy to encourage child spacing since house hold size is one of the elements of mother's socioeconomic characteristics and the majority of mothers within the study area had 5-7 children. The researcher recommends that the government other health and nutrition working organizations should create strategy to strengthen mothers' feeding practices behavior to their children. Health and nutrition workers should come up with strategies to ensure that children discharged from nutrition treatment programs are followed up periodically and their nutritional status documented to enhance timely identification of possible relapse cases.

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List of Abbreviations and Acronyms
CCPs: Child Care Practices
MDG: Millennium Development Goal
NS: Nutritional Status
UNICEF: United Nations International Children's Emergency Fund
USAID : United States Agency for International Development
WHO : World Health Organization

Introduction
Background of the Study
The issue of child care practices have a long history and have been studied overtime. The concept of child care practices started in Britain in early 19th century and the reason was to care the child of working mothers [1]. In France, the issue also began in 19thcentury by charitable institutions for poor, deprived, often abandoned children [2]. In Asia, specifically Philippines the idea of child care practices startedunderthedirectionofearlyAmerican missionariesin1924(Palatto-Corpus,1993).points out that child care practices have much longer history as a part of colonization activities in Africa than many seem to have realized. In Mauritius,

the concept of child care practices became popular in 1978. In Kenya the idea of child care practices were started in 1942.In Somaliland, the issues of child care practices were established in 1997 (Regional Health Office, 2016). While the concept of child care practices are anchored on several advantages in health of children 0-5 years old in Borama town, and while it portend a great deal for developing countries like Somaliland, its effect on nutritional status still not clear and remains largely undocumented. Yet child care practices are going much currency.

Childcare practices (CCPs) have various definitions. CCPs are complex set of behaviors that range from child feeding practices to responses that promote a safe and healthy environment for the child (UNICEF, 1990). It can also be referred as the behaviors of the caregivers, which translate food security and health care resources into child growth and development [3].Moreover, CCPs play a great role in influencing the nutritional status of infants and children (UNICEF,1998).This study refers CCPs to child rearing practices by the mother and other caregivers for the wellbeing of their children under the age of five years. CCPs have varied characteristics. According to Grace (2014), CCPs are characterized as child demographic characteristic, mothers/caregivers socioeconomic and demographic characteristics, hygiene sanitation practices, utilization of health services and feeding practices. These practices can also be operationalized as availability of health services, healthy environment and mothers/caregivers' socioeconomic characteristics. characterized CCPs as a complex concept including a range of behaviors and practices of caregivers that provide the food, healthcare, hygiene and sanitation, stimulation, and emotional support necessary for children's healthy survival, growth and development. This study operationalizes CCPs as sanitation, mothers' socioeconomic characteristics and feeding practices. These have significant important roles on nutritional status of the children. Sanitation is defined as an effort to improve environmental quality, which occurs when there are changes in the environment due to shifts in environmental conditions [4]. Sanitation can be observed in areas such as food hygiene and safety, water supply, garbage management, and toilet availability [5]. According to Grace (2014), socioeconomic characteristics refer to measures of a mother's economic and social status; these include level of education, employment status, and household size [5]. Feeding practices refer to methods of feeding infants and young children based on WHO/UNICEF recommendations [6]. These include exclusive breastfeeding, complementary feeding, and feeding during illness [7].

Nutritional status (NS) has various definitions. According to Cogill (2003), NS is a status which is determined by a child's health after physical examination and anthropometric measurements; the child's nutritional status is influenced by the intake and utilization of nutrients. It is also as a result of child care provided and the current status of a child in terms of food intake and health [8]. Moreover, NS is the condition of the body in those respects influenced by the diet; the levels of nutrients in the body and the ability [9]. This study conceptualizes NS as a condition of health of children that is influenced by the intake and utilization of nutrients.

NS has different dimensions. According to Makau (2013), NS refers to the anthropometric status for children, weight for age, weight for height and height for age indices. It is also characterized as height for age z scores, weight for age z scores, and weight for height z scores [10]. It can also be operationalized as anthropometric status for children expressed in height for age, weight for age, and weight for height [11]. This study operationalizes NS as anthropometric status for children expressed in height for age (stunting), weight for age (underweight), and weight for height (wasting). Guided by the theory of Health Belief Model, this study investigated the effect of childcarepracticesonnutritionalstatusofchildren0-5year sold in Boram town, Somaliland. The theory states that nutritional status is an effort of behavioral change (Dennis,2014). It holds that mothers should be able to identify the benefits of child care practices and barrier that keep them from caring their children. It has been adopted in this study because it is anchored behavior change which is what this study intends to achieve. The theory was used by John and Grant to study feeding practices and nutritional status in India (Khan, 2015). Malnutrition in childhood has many adverse consequences for child survival andlong-term well-being and has major concern across the world. Globally in 2015, about 7.7% of children were wasted, 24.5% were stunted and 15% were underweight. The African region and South-East Asia have reported the highest prevalence of under nutrition, with the former accounting for about 39.4% of the stunted, 24.9% of the underweight and 10.3% of the wasted children under 5 years of age [12]. According to the Millennium development goal (MDG) report (2015), sub-Saharan Africa (SSA) accounts for one third of all undernourished children globally, highlighting that malnutrition still remains a major health concern for children under 5 years in the sub-region, thus buttressing the need for urgent intervention. In Kenya, the prevalence of stunting nationally, falling from 35 % in 2008 to 26 % in 2014 but stunting still highest in the Coast, Eastern, and Rift Valley regions and it is most prevalent among children 18-23 months, indicating that poor complementary feeding and hygiene and sanitation practices are likely contributors to stunting in that age group [13]. Malnutrition rates across Somalia are among the worst in the world and 2.8 million children were severely affected by acute malnutrition in 2018 [14]. In Somaliland, the prevalence of acute malnutrition among children 0-5 years old suddenly increasing. It increased from 21.9% in2016 to 34% in 2017, and 44.8% in 2018(MOH,2019). In Borama town, the proportion of moderate acute malnourished children increased from 23%in2016to 37.3% in 2017 and from37.3% to 39.7% in 2018 (Awdal Regional Health Office, 2019). This reflects a general increase of 33.3% in 3 years, or an increase 11.1% per year in moderate acute malnutrition, which has resulted in increased cases of death among children under five years within the study area by 0.5% in 2016 to over 2% in 2018 (Awdal Regional Health Office, 2018). This reflects that there is an increase of prevalence of malnutrition of children 0-5 years by 11.1% in each these three consecutive years.

Statement of the Problem
The problem of this study was high prevalence moderate acute malnutrition and related death among the children 0-5 years old in Borama town. The proportion of moderate acute malnourished children increased from 23% in 2016 to 37.3% in 2017 and from 37.3% to 39.7% in 2018. This reflects a general increase of 33.3% in 3 years, or an increase 11.1% per year, which has result in increased cases of death among children 0-5years old within the study area by 0.5% in 2016 to over 2% in 2018 and this is expected to increase further. This also indicated that the prevalence of moderate acute malnutrition of children 0-5 years has been increasing steadily with in Borama town. Available studies and interventions have not addressed this issue and focused elsewhere such as dietary habits and knowledge, attitudes and practices of primary health care providers. Therefore, there was a limited information on the exact role of child care practices on nutritional status of children 0-5 years old in Borama town. This creates a gap as to whether childcare practices may be the link to the continued

increase in prevalence of moderate malnutrition and related death of children 0-5 years old in Borama town. Therefore, this study aims at investigating the role of child care practices on nutritional status of children 0-5 years old in Borama town.

Research Objectives
General Research Objective
The general objective of this study was to investigate the effect of child care practices on nutritional status of children 0-5 years old in Borama town, Somaliland.

Specific Research Objectives
This study was guided by three specific objectives. The objectives of this study were to:

1. Assess the effect of sanitation on nutritional status of children 0-5 years old in Borama town, Somaliland.
2. Assess the effect of mothers' socioeconomic characteristics on nutritional status of children 0-5 years old in Borama town, Somaliland.
3. Establish the effect of feeding practices on nutritional status of children 0-5 years old in Borama town, Somaliland.

Research Questions
General Research Question
The study sought to answer the general research question – what are the effect of child care practices on nutritional status of children 0-5 years old in Borama town, Somaliland.

Specific Research Questions
This study was guided by the following specific research questions:

1. What is the effect of Sanitation on nutritional status of children 0-5 years old in Borama town, Somaliland.
2. What is the effect of mothers' socioeconomic characteristics on nutritional status of children 0-5 years old in Borama town, Somaliland.
3. What is the effect feeding practices on nutritional status of children 0-5 years old in Borama town, Somaliland.

Scope of the Study
This study on effect of child care practices and nutritional status of children 0-5 years old conducted in four MCHs in Borama town. It particularly investigated sanitation, mothers' socioeconomic characteristics and feeding practices with respect to nutritional status of children 0-5 years old. Furthermore, the study also used cross-sectional survey research design. Data collected by researcher using questionnaire on a purposive, stratified and random sample of 196 children attending on four MCHs; analyzed using both descriptive and inferential statistics and reported in figures and tables.

Significance of the Study
This study provides information which might be used to child care practices so as to enhance the nutritional status of children 0-5 years old particularly in Borama town and Somaliland generally. In addition to that it should also help as a reference material to other researchers in the field of health. On the other hand, the study should also be useful to ministry of health and other organizations related to health programs like UNICEF, World Vision, Save the Children and others to develop nutrition related programs promoting the nutritional status of children 0-5years of age. Besides that, it was also be useful to all health professionals of Borama district and Somaliland as a whole to develop guideline

to tackle nutrition related health problems. Finally, the study is expected to benefit mothers with children aged 0–5 years in Borama town, as well as those across Somaliland as a whole.

Conceptual Framework
This study was guided by Health Belief Model, and based on framework depicted in figure1.
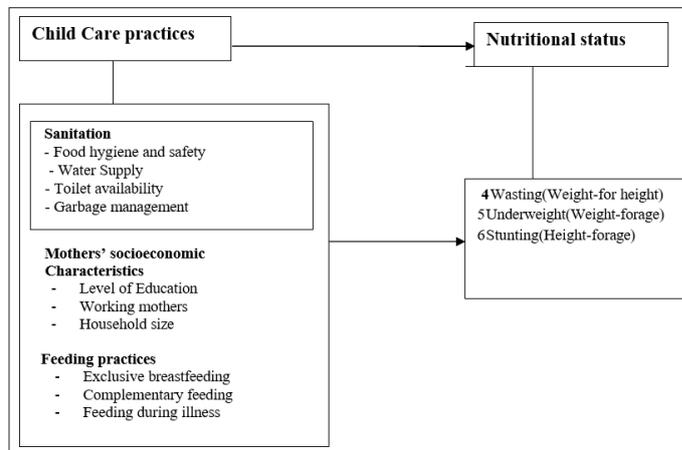
Figure 1: Conceptual Framework of the Childcare Practices and Nutritional Status The conceptual framework in Figure 1 depicts the relationship between childcare practices and nutritional status. The childcare practices were conceptualized as sanitation, mothers' socioeconomic characteristics and feeding practices. Sanitation was operationalized as, food hygiene and safety, toilet availability, and garbage management. Whereas mothers' socioeconomic characteristics are operationalized as, level of education, working mothers and household size. While breastfeeding practices are operationalized as exclusive breastfeeding, complementary feeding, and feeding during illness. On the other hand, nutritional status was conceptualized as stunting (height forage), underweight (weight forage), and wasting (weight for height).

Review of Related Literature
This chapter review literature related to child care practices with the focus on sanitation, socioeconomic characteristics and feeding practices as they relate to the nutritional status of children 0-5 years old.

Sanitation and Nutritional Status
Sanitation has various definitions. Sanitation refers to public health conditions related to cleaning drinking water and adequate treatment and disposal of human excreta and sewage (Bond, 2013). It can also be defined as an effort to improve environmental quality, which is done when there are changes in the environment due to the shift of environmental quality [15]. According to WHO (2010), sanitation is prevention of diseases and promotion of human dignity and well-being, making it the perfect expression of WHO's definition of health, as expressed in its constitution, as "A state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity". Food hygiene and safety, toilet availability and garbage management are the elements of sanitation. Food hygiene and safety is a careful hygienic preparation and storage of complementary foods which is crucial to prevent contamination [16]. Toilets are sanitation facilities at the user interface that allow the safe and convenient urination and defecation. (The Swiss Agency for Development & Cooperation, 2008). Garbage management industry revolves around the collection, storage, and disposal of waste, ranging from

ordinary household waste to the waste generated from industrial plants [17].

Sanitation has been found to be related to the nutritional status. A study done by in Peru found that the places where inadequate disposal of sewage, and poor water sources and storage accounted for a 1 cm height deficit in children aged 24 months when compared to their counterparts living with better sanitation and water conditions. A study conducted by in rural Bangladesh found that environmental contamination, linked to open defecation, caused linear growth faltering and children living in clean household environments had 0.54 standard deviation higher height- for age scores (22% lower stunting) than their counterparts living in dirty environments. A study carried out by Checkley (2008) in India found that diarrheal diseases, caused by poor sanitation, accounted for 25 percent of stunting in children up to 24 months. Therefore, sanitation relates directly to the nutritional status of children 0-5 years old [18,19]. However, the researcher takes a note of that fact that these studies were all conducted outside Somaliland and also their applicability in Borama district need to be verified.

Mother's Socioeconomic Characteristics and Nutritional Status
Socioeconomic characteristics have variety of definitions. Grace (2014) defined socioeconomic characteristics as the level of education, occupation, household size and household income. It can also be viewed as a combined measure of mother's or family's economic and social position relative to others, based on income, education, and occupation [20]. Socioeconomic characteristics are defined as a measure of mother's combined economic and social status [21]. Level of education, working mothers and household size are the elements of socioeconomic characteristics. Level of education of the mother is the indication of her economic level and also demonstration of her knowledge level and ability to adequately care for her child (USAID, 2005). Working mother is the mother who does work outside of her home (Lamontagne, Engle&Seitlin,1998). Household size is the number of persons usually residing in household and share house hold expenses or common kitchen [22]. Mother's socioeconomic characteristics have been found to have strictly related to the nutritional status. A study conducted by in Nigeria suggests that educated mothers are better equipped to enhance childcare practices and thus better outcomes [23]. Another a study done by Moser (1990) in Guayaquil (Ecuador) showed that, in times of recession, maternal employment had a negative impact on child care giving time and on children's nutritional status, not only because more women started to work and tended to work longer hours, but also because women returned to work when their children were younger. Furthermore, a study conducted by in Tanzania showed that the prevalence of childhood malnutrition was higher in households of employed mothers than households of mothers who were housewives or self-employed [24]. Thus, mothers' socioeconomic characteristics relate nutritional status of children 0-5 years old. However, these studies were all conducted outside Somaliland. As such, they cannot be applied wholesome without empirical justification.

Feeding Practices and Nutritional Status
Feeding practices have various definitions. According to WHO and UNICEF (2011), feeding practices can be referred to practices (both breastfeeding and complementary feeding) in feeding infants and young children based on WHO/UNICEF recommendations. These are also actions carried out by a caregiver relating to breastfeeding and complementary feeding, solid and semi-solid foods, given to a child (Kamau, 2014). WHO, UNICEF and USAID (2010), viewed feeding practices as various dimensions include continued breastfeeding, appropriate timing of introduction of complementary foods, and optimum quantity and quality of the foods consumed. Therefore, it can be viewed that exclusive breastfeeding, complementary feeding and feeding during illness as the elements of feeding practices. Exclusive breastfeeding is feeding of infant only breast milk fronts the mother or a wet nurse or expressed breast milk, and no other liquids or solids with the exception of drops of syrups consisting of vitamins and mineral supplements. (Mohamed,2007). Complementary feeding refers to the process starting when breast milk is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are introduced to the infant, along with breast milk (PAHO &WHO, 2003). Feeding during illness is feeding during common childhood illnesses, such as pneumonia, diarrhea, measles, HIV/AIDS, malaria and fevers (WHO, BASICS & UNICEF, 1999).

Feeding practices have been found to have closely related to nutritional status. A Study conducted by Anganwari (2007) on association between feeding practices and under- nutrition in areas of urban Allahabad established that; delayed initiation of breast-feeding, deprivation from colostrum, and improper complementary feeding are significant risk factors for under-nutrition among under-fives. And other study conducted by in the neighboring Ethiopia, revealed that only 10.8% of children are fed with the minimum recommended number of food groups and the study continues to suggest that the older a child gets, the more he consumes meals from diverse food groups. A study conducted Nti (2007) in Ghana showed that the duration of breast-feeding was negatively correlated with increment in length and weight until 12 and 24 months. Feeding practices relate directly to the nutritional status of children 0-5years old. However, these studies were all conducted outside Somaliland. So that, they cannot be applied wholesome without empirical justification.

Reseach Methodology
This section presents the methods and techniques that was used to explore the effect of child care practices on nutritional status of children 0-5 years old in Borama town, Somaliland. The methodology include: the research design, location of study, sampling techniques, sample size, research instruments, data collection procedures, and data analysis techniques.

Research Area
This study was conducted four MCHs in Borama town, the capital and the largest city of the north western Awdal region of Somaliland. It locates 108 km west of Hargiasa - the capital city of Somaliland, 3km to north of the Ethiopian border. The population of Borama town is approximately 415,616 (FAO, 2015). It lies between 8oNand 11oN above the sea level (UNHCR, 2014). Borama town has been selected because it is the most important town Data Collection.

Research Design
This study was conducted through cross-sectional survey research design to collect data from the target population at one point in time. This would guarantee that a diversity of views on child care practices was collected from a large sample in a short time (Chris Olsen, 2004). Variables such as sanitation, mothers' socioeconomic characteristics and feeding practices may not be manipulated because these variables that were investigated were issue that the researcher has no control [25].

Study Population
Target Population
The target population of this study comprised 400 children of below five years of age attending in four MCHs in Borama town, Somaliland. MCHs admit children of 0-5 years old experiencing malnutrition, therefore was easier to get these malnourished children and the data obtained from the respondents was good representation (MOH, 2017).

Accessible Population
The accessible population was the whole target population. This is because the whole target population could be reached by the researcher. Accessible population only makes sense when the entire target population cannot be reached. So, there was no need to select an accessible population.

Sample and Sampling
Sample Size
The sample size consisted of 196 children distributed across four MCHs in Borama town. The sample has been determined according to tables of samples of (Krejci & Morgan,1970). Krejcie and Morgan (1970) recommend a sample of196 for a population of 400 at level of confidence 95%, and 5% margin of error, which were the same boundaries set in this study (AppendixV).

Sampling Techniques
The study used purposive sampling, stratified sampling and simple random sampling techniques to select the sample. Purposive sampling was used to subjectively select four MCHs from the MCHs. Stratified sampling was used to determine that the number of children from each MCH had a chance to be part of the sample. Therefore, each MCHs represented in the sample proportionately; the main advantage of stratified sampling is that it enhances the representation of strata within the population in the sampling as well as ensures that a stratum is not over represented (Charmaz, 2014). Simple random sampling was used to select each child from each MCH stratum. As a result, each child has an equal and independent chance to be chosen; as a result, the representativeness of the sample was achieved [27].

Data Collection
Data Collection Methods
The study used self-administered interview and observation method to collect data. Questionnaire was used because of the large sample size involved. Self-administered interview was chosen because the respondents were semi-illiterate and the target population are accessible. Observation method was used to obtain descriptive quantitative data on the incidence of particular sorts of behavior or events (Galton, 2007).

Data Collection Instruments
Semi-structured questionnaire and observation analysis check list was the main tool used to collect data. This enabled the researcher to collect both qualitative and quantitative and fairly simple analyses procedures; semi-structured questionnaire is formed from blend Questionnaire of item which restricts respondents on answer format and as well as allow them to react freely in their own self-constructed words (Wilkinson, 2003).

Research Procedures
The researcher developed a proposal under the guidance of supervisor. He sought permission from the School of Postgraduate and Research Studies and from the Ministry of health. The instruments were piloted in Dilla district. Once the instruments were validated, the researcher proceeded to collect data from 196 mothers having children 0-5 years. The researcher further sought permission from the head of the facilities and mothers. After the instruments validated and permission was granted, the researcher proceeded to collect data from 196 mothers having children 0-5 years old attending MCHs in Borama.

Quality Control
Piloting
The instrument was piloted in Dilla, because Dilla is the nearest town to Borama town and it is possible to get healthy facilities to satisfy the purpose of piloting. Therefore, it is a true representation of study area. During piloting, the researcher sought to attain a validity and reliability tool rates of 0.70. Piloting is important because it gives the researcher an advance warning about where the researcher instrument could fail, where the protocols may not be followed or whether the instruments are too complicated (Baker 1994). Piloting test ensured that the research instrument can be used properly and the information obtained was consistent [27].

Validity of Instruments
Validity refers to how well a test measure is. Therefore, validity issue was addressed by assessing the questionnaires by giving it to 2 assessors who are expert to the field to ascertain the validity of the data collection tools each item on the 1-4 scale were 1 = is Not Relevant (NR), 2 = is Somewhat Relevant (SWR), 3 = is Quite Relevant (QR) and 4 = is the Very Relevant. Content validity of a questionnaire is the area to which an instrument accurately addresses objectives, questions, or the extent to which an instrument actually measures what it is intended to measure [28]. The results summarized in Table 1.

Table 1: Content Validity Table

Judge2					
Judge1	1	2	3	4	Total
1	0	0	0	1	1
2	0	0	0	0	0
3	0	0	0	8	8
4	0	0	0	24	24

Note. Shaded area reflects 3 and 4 which are the items rated quite relevant and very relevant by judges one and judge two.

Validity was determined from items rated 3 and 4 by both judges as CVI= n3/4/N: where n3/4, is items rated relevant and very relevant by both judges, and N is the total number of items: CVI=32/33=0.96. A validly index of 0.96 was reported. This was an accepted measure because it was higher than the .70 value recommended is social science research.

Reliability of Instruments
The test-re-test method was used to assess reliability. Test-retest reliability is a statistical technique used to estimate components of measurement error by repeating the measurement process on the same subjects, under conditions as similar as possible, and comparing the observations using statistical techniques (Hendrickson, 1993). The instruments were administered twice to the same pilot sample of 33 mothers having children below five years of age in Dilla district within 14 days. All responses in the first phase were coded 1. The responses of each respondent were added to obtain the total score of a respondent on the instrument. After 14 days, the same questionnaire was administered to the same of 33 mothers having children below five years of age in

Dilla district. All responses were coded such that if a respondent provided the same response to the same item, it was coded 1 and if the response differed from the first response, it was coded 2. The reliability was calculated using the Reliability formula

$$Y = 1 - \frac{T2-T1)}{T^1} = Y = 1 - \frac{1091-1098}{1098\cdot} = 0.99 \text{ or } 99\%$$ where T1 is the

sum of test 1 scores and T2 score (Appendix IX). Thus, a reliability index of 99% was reported.

It is the best traditional method to assess the results of two tests constructed in the same way from the same content area (Hendrickson, 1993). The main advantage of the test/retest method is that it permits the instrument to be compared with itself [27].

Data Analysis

Data was analyzed using both descriptive and inferential statistics. Descriptive statistics employed the use of percentages and frequency and inferential statistics using binary logistic regression. Percentages were used to analyze demographic data. Binary logistic regression was employed in the analysis in order to measure the effect of the various variables on the nutritional status; data was analyzed at 5% margin of error, 95% confidence level by using the model below:

Logit $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + E$ Where

Y=Dependent variable, nutritional status (0,1)
α=Constant
β= Increases in log odds for a one unit increase in X
X_1=Independent variable, Sanitation
X_2=Independent variable, mother's socioeconomic characteristics
X_3=Independent variable, Feeding practices E= Error term

Ethical Considerations

The researcher informed all participants of the intentions of the study. He also analyzed the collected data professionally. Furthermore, the researcher obtained all the necessary permits from the School of Postgraduate and research Studies, ministry of health as well as other necessary requirements to ensure that the study did not break any ethical obligation. Besides that, the researcher confirmed that all information received from the participants will never be shared by other parties or people

Results and Findings

This chapter presents findings and results of the study on effect of child care practices on nutritional status of children 0-5 years old in Borama town, Somaliland. Child care practices were characterized as sanitation, mothers' socioeconomic characteristics and feeding practices. This section makes analysis and presents results and findings along the themes sanitation, socioeconomic characteristics of mother and feeding practices. The return rate of this study was 90%.

Demographic Characteristics of Respondents

The demographic information was collected on age, marital status, area of residence, and level of education of respondents. Demographic data is presented to enable the reader to assess the representativeness of the data and its applicability to their populations of interest. Data on demographic factors was organized using the percentages technique as summarized in the following subsections.

Age Category of Respondents

The respondents were also asked to indicate their age. This was necessary to determine the representativeness of data. The responses are summarized in Figure 2
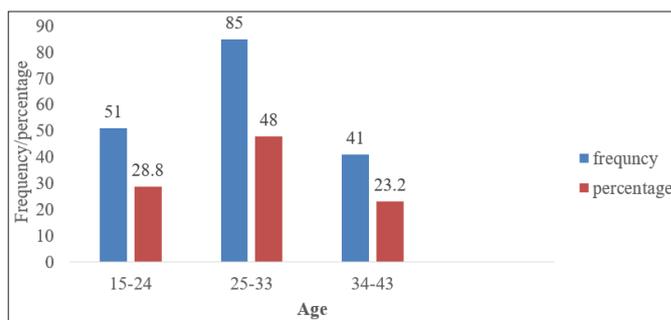
Figure 2: Age Category of the respondents

Figure 2: presents the age categories of the respondents, revealing that 48% of participants were aged 25-33 years, while 28.8% were aged 15-24 years. A smaller proportion, 23.2%, were aged 34-43 years. This distribution indicates that the study captured a significant proportion of mothers within the typical age range for child-rearing (15-43 years). Consequently, their perspectives on the impact of child care practices on nutritional status were considered reliable for the study's findings.

Distribution of Respondents by Marital Status

The respondents were asked to indicate their marital status, and the results are illustrated in Figure 3. Understanding the marital status of the participants provides an important demographic context, which may influence factors relevant to the study.
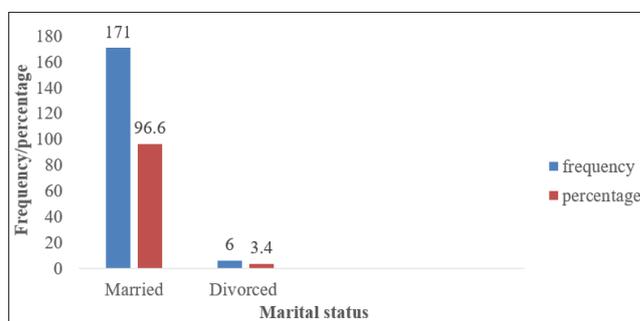
Figure 3: Distribution of the Respondents by Marital Status

Figure 3 Illustrates the distribution of respondents by marital status. The majority of respondents (96.6%) were married and living with their spouses, while a small proportion (3.4%) were divorced. This demographic composition highlights the predominance of married individuals in the study.

Distribution of Respondents by Residence

Respondents were asked to indicate their areas of residence to assess the distribution of women within the sample in relation to the broader population. The distribution is summarized in Figure 4, providing insights into how well the sample reflects the geographical representation of the population under study.

Figure 4: Distribution of Respondents by Area of Residence

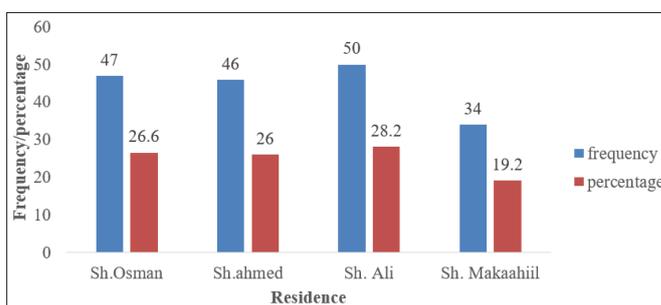Figure 4 shows the distribution of respondents by area of residence. The majority of respondents (28.2%) were from sh. Ali jawhar, followed by 26.6% from sh. Osman and 26% from sh. Ahmed salaam. A smaller proportion, 19.2%, were from sh. Makaahil. This distribution indicates that sh. Ali jawhar contributed the largest number of respondents, highlighting its significance in the overall sample composition.

Distribution of Respondents by Level of Education

Respondents were asked to indicate their level of education to determine its potential influence on the nutritional status of their children. Understanding the educational background of the respondents was crucial for assessing whether there is a significant relationship between education and child nutrition. The distribution of respondents by education level is shown in Figure 5.
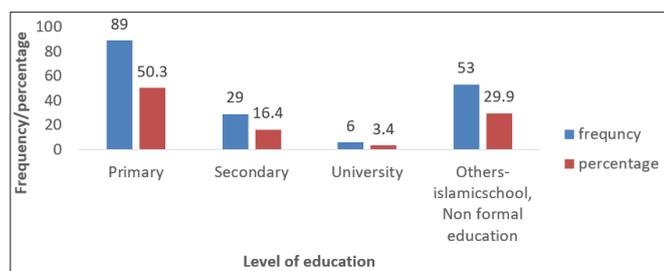

Figure 5: Distribution of Respondents by their Level of Education

Figure 5 presents the distribution of respondents according to their level of education. The results indicate that 50.3% of the mothers had attained primary education, 29.9% had non-formal education or attended Islamic schools, 16.4% had completed secondary education, and only 3.4% had received university education. Overall, the majority of respondents had either primary or non-formal/Islamic education, which can be categorized as lower levels of education. This distribution provides important context for examining the potential link between education and the nutritional status of their children.

Description of Nutritional Status among the Children

This section describes indices of the nutritional status of the children in the study area. These indices include weight for height, weight for age, and height for age of children to assess the nutritional status of children within the study area.

Table 2: Distribution of Wasting (Weight/Height

Frequency		Percentage
Wasted	112	63.2
Normal	65	36.8

Table 2 presents the distribution of children aged 0-5 years in Borama district based on their nutritional status. The data indicates that, at the time of data collection, 63.2% of the surveyed children were classified as wasted, while 36.8% exhibited normal weight for their age. This finding highlight that more than 50% of the children in the study had low weight relative to their appropriate weight standards, underscoring a significant public health concern regarding child nutrition in the area.

Table 3: Distribution of Underweight

	Frequency	Percentage
Underweight	111	62.7
Normal	66	37.3

Table 3 illustrates that a significant proportion of the children in the study, approximately 62.7%, had low weight for their age, indicating underweight status. In contrast, only 37.3% of the children were found to have a normal weight for their age. This finding suggests that the majority of the children (62.7%) are malnourished, as they fall below the standard weight range for their age group. This high prevalence of underweight status points to a concerning level of malnutrition among the children studied.

Table 4: Distribution of Stunting

	Frequency	Percentage
Stunted	110	62.2
Normal	67	37.8

Table 4 presents the distribution of stunting among the children in the study. The findings indicate that 62.2% of the children (n = 110) are classified as stunted, while 37.8% (n = 67) fall within the normal height range for their age. These results suggest that a significant majority of the children, accounting for 62.2%, experience stunting, highlighting a concerning prevalence of chronic malnutrition within the population studied.

Effect of Childcare Practices on Nutritional Status
Introduction

The purpose of this study was to investigate the effect of childcare practices on the nutritional status of children 0-5 years of age in Borama town, Somaliland. To realize this purpose, the study focused on three specific objectives: to assess the effect of sanitation; to assess the effect of mothers' socioeconomic characteristics; to establish the effect of feeding practices on the nutritional status of children 0-5 years old in Borama town, Somaliland.

Sanitation and Nutritional Status

The first objective of this study was to assess the effect of sanitation on the nutritional status of children aged 0-5 years in Borama town, Somaliland. Table 5 presents a summary of the mean and standard deviation for the population studied.

Table 5: Descriptive Analysis of Sanitation

Items	N	Minimum	Maximum	Mean	Std. deviation
Where do you get water for domestic use?	177	1	4.0	2.63	.589
Do you treat water before drinking?	177	1	2.0	1.52	.0501
Method for treating drinking water	177	.0	5.0	2.23	2.166
Do you wash your hands?	177	2.0	6.0	2.04	.375
On which occasions do you wash your hands?	177	2.0	6.0	5.0565	1.12673
Do you use soap when washing your hands?	177	.0	2.0	1.5706	.50771
On which occasions do you use soap when washing your hands?	177	.0	6.0	2.7401	2.54510
Do you have a toilet?	177	2.0	2.0	2.0	.0
How do you dispose of refuse at home?	177	1.0	3.0	2.2825	.65659

The descriptive statistics presented in Table 5 illustrate key findings regarding domestic water use and hygiene practices among respondents. The mean response concerning water sources for domestic use was recorded at 2.63 (SD = 0.589), indicating that the majority of respondents utilized tap water. In terms of treating drinking water, the mean response was 1.52 (SD = 0.501), suggesting that most respondents did not engage in water treatment practices. Furthermore, the mean score for methods of treating drinking water was 2.23 (SD = 2.166), indicating that a significant number of respondents did not employ any specific method for treating their drinking water.

With respect to hand washing practices, the mean response was reported as 2.04 (SD = 0.375), which suggests that the majority of respondents regularly washed their hands. The mean score for the occasions on which hand washing occurred was notably high at 5.05 (SD = 1.12673), reflecting that most respondents washed their hands before eating. Additionally, the mean response regarding the use of soap during hand washing was 1.57 (SD = 0.50771), indicating that the majority of respondents did use soap when washing their hands. For the occasions of using soap, the mean response was reported as 2.74 (SD = 2.545), suggesting that many respondents utilized soap primarily after cleaning their baby's bottom.

Importantly, the mean response regarding toilet availability was reported as 2.0 (SD = 0.0), indicating that all respondents had access to toilets. Lastly, the mean response concerning refuse disposal methods at home was recorded at 2.28 (SD = 0.65659), indicating that most respondents employed practices such as burning, burying, or placing refuse in a dustbin for disposal. Collectively, these findings highlight significant insights into the domestic water use and hygiene practices within the study population.

Mothers' Socioeconomic Characteristics and Nutritional Status

The second objective of this study was to assess the effect of mothers' socioeconomic characteristics on the nutritional status of children aged 0-5 years in Borama town, Somaliland. Table 6 provides a summary of the descriptive statistics related to the socioeconomic characteristics of the mothers. This data is essential for understanding how factors such as income, education, and employment status may influence child nutrition in the study population.

Table 6: Mothers' Socioeconomic Characteristics

Items	N	Minimum	Maximum	Mean	Std.Deviation
Are you employed?	177	1.00	3.00	1.5085	.51255
Where are you employed?	177	.00	5.00	1.4746	1.47351
Hours you work per day?	177	.00	4.00	1.5141	1.55252
Household Size(persons)	177	1.00	5.00	1.9153	.80386

Theanalysis of mothers' socioeconomic characteristics reveals significant findings regarding their employment status and household size. The mean response concerning employment status was recorded at 1.51 (SD = 0.51255), indicating that approximately 50% of respondents were not employed. Additionally, the mean response regarding the respondents' places of employment was reported as 1.47 (SD = 1.47351), suggesting that around half of the respondents were engaged in their own businesses.

Furthermore, the mean response for working hours was presented as 1.51 (SD = 0.80386), indicating that the majority of respondents typically worked approximately 8 hours per day. Lastly, the mean response for household size was reported as 1.92 (SD = 0.80386), which implies that most respondents lived in households consisting of 5 to 7 individuals.

Feeding Practices and Nutritional Status

The third objective of this study was to establish the effect of feeding practices on the nutritional status of children aged 0-5 years attending Maternal and Child Health (MCH) centers in Borama town, Somaliland. This objective aims to analyze how various feeding practices influence the nutritional status of children. The result was summarized in Table 7.

Table 7: Description of Feeding Practices of Mothers

Items	N	Minimum	Maximum	Mean	Std. deviation
Do you breastfeed your child	177	1.00	5.00	1.9944	.32852
Day initiation breastfeeding	177	.00	5.00	4.2655	1.17869
Time (hrs) after delivery for breastfeeding	177	.00	4.00	1.7966	1.58952
Breastfeeding on demand	177	1.00	3.00	1.4972	.52358
Do you give your child local complementary foods?	177	1.00	3.00	1.8701	.35364
What local complementary foods were introduced to your child	177	.00	3.00	1.9774	1.02222
Frequency of giving local complementary foods	177	.00	3.00	1.5424	.85258
Giving snacks between main meals	177	1.00	2.00	1.5254	.50077
Child sickness in last one month	177	1.00	2.00	1.6102	.48910
Where to seek treatment after the child is sick	177	.00	4.00	1.8079	1.58736
Do you increase feeding when the child is sick	177	1.00	4.00	1.2881	.52389

Table 7 presents an analysis of breastfeeding practices among mothers. The mean response related to breastfeeding was recorded at 1.9944 (SD = 0.32852), suggesting that a significant majority of mothers engaged in breastfeeding during the data collection phase. This high prevalence is vital for meeting infants' nutritional needs and emphasizes the critical role of breastfeeding in promoting child health.

Regarding the initiation of breastfeeding, the mean response was noted at 4.2655 (SD = 1.17869), indicating that most mothers began breastfeeding on the first day following delivery. Early initiation of breastfeeding is linked to numerous positive health outcomes, including enhanced maternal-infant bonding and improved neonatal immunity. This finding reflects commendable practices within the community and aligns with established guidelines that advocate for timely breastfeeding initiation.

Furthermore, the mean response concerning the timing of breastfeeding initiation post-delivery was reported as 1.7966 (SD = 1.58952), suggesting that the majority of mothers-initiated breastfeeding within 30 minutes of childbirth. This prompt initiation is crucial for optimizing health outcomes for both mothers and infants and corresponds with recommendations from health organizations.

On the other hand, the mean response for breastfeeding on demand was recorded as 1.4972 (SD = 0.52358), indicating that a considerable number of mothers did not adopt this practice. This finding highlights a potential area for improvement, as responsive feeding practices are vital for enhancing infant feeding success and overall nutritional status.

With respect to complementary feeding practices, the mean response for providing local complementary foods was reported as 1.8701 (SD = 0.35364), signifying that most mothers introduced complementary foods to their children. This practice is essential for fulfilling the changing nutritional requirements of growing children. Additionally, the mean response regarding the frequency of complementary feeding was noted as 1.5424 (SD = 0.85258), suggesting that the majority of mothers provided complementary foods approximately three times a day.

However, the mean response regarding the provision of snacks between meals was recorded at 1.5254 (SD = 0.50077), indicating that most mothers did not offer snacks. This lack of snacking may affect children's overall energy intake and nutritional adequacy, necessitating further examination.

Moreover, the mean response concerning child illness within the past month was reported as 1.6102 (SD = 0.48910), with most respondents indicating that their children had experienced illness during this timeframe. This finding suggests a significant burden of morbidity within the studied population. Additionally, the mean response regarding seeking treatment when a child is sick was recorded at 1.8079 (SD = 1.58736), indicating that most mothers opted to visit nearby pharmacies for medications.

Lastly, the mean response regarding increasing food intake for sick children was noted at 1.2881 (SD = 0.52389), suggesting that a majority of mothers did not increase feeding when their children were ill. This is concerning, as adequate nutrition during illness is crucial for recovery and for maintaining overall nutritional status.

Model Description
This section describes the model of significance, variance and goodness of fit.

Table 8: Significance

	Chi-square	Df	Sig.
Step1 Step	3.827	3	.010
Block	3.827	3	.021
Model	3.827	3	.022

Table 9: Variance

Step	-2Loglikelihood	Cox & Snell R Square	NagelkerkeR Square
1	174.967[a]	.021	.034

The table 9 describes the variance of the model. It indicates that the model explains between 2.1% to 3.4% of variation in the dependent variable. The other variation is explained by other factors

Table 10: Goodness of Fit

Step	Chi-square	Df	Sig.
1	8.531	8	.383

Table 10 describes goodness of fit of the model. This is needed to be insignificant of the model. If p>0.05 it indicates insignificance which is good for the model.

Table 11: Regression Analysis of Child Care Practices on Nutritional Status

	B	S.E	Wald	Df	Sig	Exp(B)	95.0%	C.I.forEXP(B)
							Lower	Upper
Sanitation Mother's	.072	.031	5.298	1	.021	.074	1.011	1.142
Socioeconomic characteristics	.011	.009	1.270	1	.260	1.011	.992	1.029
Feeding Practices	.042	.020	4.653	1	.031	.930	1.004	1.084
Constant	-1.773	.911	3.788	1	.052	.170	1.011	1.142

$$LogitY = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + E$$

$$From the model logit Y = -1.773 + .072 + .011 + E$$

The results of the binary logistic regression analysis presented in Table 11 provide important insights into the factors affecting the nutritional status of children aged 0-5 years in Borama Town, Somaliland. The analysis indicates that sanitation significantly reduces the odds of malnutrition by 26% (OR = 0.074; 95% CI [1.011-1.142]; p = 0.021). This finding emphasizes the critical role of hygienic conditions in child health, as access to adequate sanitation facilities can decrease the prevalence of infectious diseases [29]. Such diseases are most often been associated with malnutrition. Improved sanitation practices may help lower the incidence of diarrhea and other gastrointestinal infections, which can adversely affect nutritional intake and absorption in young children. Conversely, the analysis indicates that mothers' socioeconomic characteristics do not significantly influence the odds of malnutrition, with an odds ratio of 1.011 (95% CI [0.992-1.029]; p = 0.260). This suggests that factors such as cultural practices, education, and knowledge about nutrition and health may have a more substantial impact on child nutrition than socioeconomic status alone, highlighting the need for further investigation into these components. Additionally, the analysis reveals that proper feeding practices significantly decrease the odds of malnutrition by 7% (OR = 0.930; 95% CI [1.004-1.084]; p = 0.031). This underscores the necessity for community education programs focused on infant and young child feeding practices, promoting breastfeeding, timely introduction of complementary foods, and encouraging healthy dietary habits among caregivers. Overall, these findings advocate for targeted interventions in sanitation and feeding practices to improve child nutrition outcomes in Borama district.

Discussion, Conclusion and recommendations
Introduction

This study investigated the effect of childcare practices on the nutritional status of children aged 0-5 years in Borama town, Somaliland. It specifically focused on sanitation, mothers' socioeconomic characteristics, and feeding practices about nutritional outcomes. A random sample of 196 children was drawn from four Maternal and Child Health (MCH) centers in Borama. Data were analyzed using descriptive statistics (percentages, frequencies, means, and standard deviations) and inferential statistics (binary logistic regression), where odds ratios were interpreted to measure the impact of independent variables on the dependent variable, as reported in Chapter Four. This chapter summarizes the findings, draws conclusions based on the findings, and makes recommendations based on the analysis and discussion.

Summary of Findings

The findings revealed concerning statistics regarding malnutrition among the surveyed children:

- **Wasting:** 63.2% of the children were wasted, while 36.8% were of normal nutritional status.
- **Weight for Age:** Approximately 62.7% had low weight for their age, with only 37.3% classified as having a normal weight.
- **Height for Age:** 41.2% of children were shorter than expected for their age, indicating a significant proportion of stunting (58.8% had normal height).

The first objective was to assess the effect of sanitation on the nutritional status of children. The study found that sanitation significantly decreased the odds of malnutrition by 26% (OR = 0.074, 95% CI: 1.011-1.142, p = 0.021). The second objective evaluated the impact of mothers' socioeconomic characteristics, which were found to not significantly affect the odds of malnutrition by 1.1% (OR = 1.011, 95% CI: 0.992-1.029, p = 0.260). The final objective investigated feeding practices, which significantly decreased the odds of malnutrition by 7% (OR = 0.930, 95% CI: 1.004-1.084, p = 0.031).

In summary, the key findings were:

1. Sanitation significantly influences the nutritional status of children aged 0-5 years in Borama Town, Somaliland, reducing the odds of malnutrition by 26%
2. Mothers' socioeconomic characteristics do not significantly affect malnutrition (1.1%)
3. Proper feeding practices are crucial, with a 7% reduction in malnutrition odds linked to these practices

Discussion

The findings of this study reveal crucial insights into the factors influencing malnutrition among children in Borama town. Firstly, the significant impact of sanitation on nutritional status (26% decrease in odds of malnutrition) aligns with previous research. For instance, noted that inadequate sewage disposal and poor water conditions led to height deficits in children, highlighting the importance of clean environments for healthy growth. Similarly, found that children in clean households experienced significantly better growth outcomes compared to those in contaminated environments [17,22].

Conversely, the study's finding regarding mothers' socioeconomic characteristics having an insignificant effect on malnutrition contradicts other studies, such as, which suggested that higher maternal education correlates with improved childcare practices. This discrepancy may be attributed to cultural factors or differences in community resources available to educated versus uneducated mothers [23].

Furthermore, the positive impact of feeding practices on reducing malnutrition (7% decrease in odds) supports previous studies, such as Anganwari (2007), which emphasized the risks associated with poor feeding practices, including delayed breastfeeding and inadequate complementary feeding. Also reported similar findings, indicating a need for enhanced dietary diversity as children age.

Conclusion
This study highlights critical factors affecting the nutritional status of children aged 0-5 years in Borama Town, Somaliland. The alarming rates of malnutrition, particularly the high prevalence of wasting (63.2%) and low weight for age (62.7%), underscore the urgent need for targeted interventions. The findings indicate that improved sanitation significantly reduces the odds of malnutrition by 26%, emphasizing the importance of hygienic conditions in promoting child health. In contrast, mothers' socioeconomic characteristics do not appear to significantly influence malnutrition rates [30-48].

Moreover, the study found that proper feeding practices are essential for reducing malnutrition, with a notable 7% decrease in odds associated with these practices. Therefore, the study concludes that addressing sanitation issues and enhancing community education on proper feeding practices are critical steps in improving child nutrition outcomes in Borama Town. Targeted interventions in these areas can significantly contribute to combating malnutrition and ensuring healthier futures for children in the region.

Recommendations
General Recommendations
First, the researcher recommends that the Ministry of Health should increase community awareness of the importance of sanitation and encourage the community weekly campaign of garbage collection from the different parts of the town. Ministry of Health together with nongovernmental health organizations should plan training on promoting knowledge, attitudes, and practices of mothers on proper disposal of household refuse. Secondly, the researcher also recommends that the policy by the government should be enacted to allow working mothers to have more time to care for their children. The government should also create a policy to encourage child spacing since household size is one of the elements of a mother's socioeconomic characteristics and the majority of mothers within the study area had 5-7 children. The researcher recommends that the government other health and nutrition working organizations should create strategy to strengthen mothers' feeding practices behavior to their children. Health and nutrition workers should come up with strategies to ensure that children discharged from nutrition treatment programs are followed up periodically and their nutritional status documented to enhance timely identification of possible relapse cases

Recommendations for Further Research
The researcher recommends that further research should be done on effect of sanitation of nutritional status since it causes the greatest effect among the study variables in this study.

Compliance with Ethical Statements
Statements and Declarations
Credit Authorship Contribution Statement

Authors Contribution
The complete conceptualization of the article was done by the first author Hassan I. Ahmed; full arrangements and the final preparation was carried out by the second author ADEBISI SUNDAY ADESINA. The third author Godfrey R. Odongo played the role of supervisions and methodology, while the fourth author Saida Abdilahi Omar assisted in formalizing the data collections.

Ethical Conduct
The research was done in accordance with relevant laws, regulations and institutional consideration.

Data Availability Statement
All relevant data are included in the paper or its supplementary Information.

Declarations
Conflict of interest
The authors declare that there is no competing or conflict of interests whatsoever.

Highlights
- The child care practice has tremendous effect on the nutritional status of children in Borama town, Somaliland
- Sanitation significantly decreases the odds of child developing malnutrition
- Socioeconomic characteristics of the mother insignificantly increase the odds of child developing malnutrition
- Feeding practices significantly decrease the odds of child developing malnutrition
- Ministry of health should increase community awareness of important of sanitation
- Policies by the government should be enacted to allow working mothers to have more time to care for their children.
- Policies ought to be in place to encourage child spacing
- Strategies should be imposed to strengthen mothers' feeding practices behavior to their children
- Children discharged from nutrition treatment programs should be followed up periodically

APPENDIXI

No.	Item	Description	Quantities	Unitcost(USD)	Estimated amount (USD)
1.	Stationery	Envelopes	2 pieces	4	8
		White papers	5 rings	5.5	27.5
		Pens	2 box	4	8
		Printing and binding	7	10	70
2	Transportation	Piloting	1 day	50	50
3	Transportation	Datacollection	25 days	15	375
4	Contingency	Emergencycosts		55	55
	Total				593.5

APPENDIXII

WORKPLAN

No.	Phase	Time(Months)	2018
1	Development of proposal and approval.	3	October, November
2	Development of Instruments, Pilotingand Qualitycontrol.	$\frac{1}{2}$	December February
3	Datacollection.	1	March
4	Data Organization, Analysis and Interpretation.	1	April
5	Report Writing.	$\frac{1}{2}$	July

Appendix 13
Questionnaire for Effect of Child care Practices on Nutritional Status of Children 0-5Years Old Attending MCHs in Borama District, Somaliland

Introduction Dear Respondent
You have been requested to take part in the study on Effect of Child Care Practices on Nutritional Status of Children 0-5 Years Old Attending in MCHs in Borama District, Somaliland. This study will be conducted by Hassan Ibrahim Ahmed, Master of PublicHealth in Human Nutrition &Dietetics student at Amoud University'

Part 1: Background Information
Please kindly provide the following information.

1. Your residence   a.Sh.makaahiil   b.Sh.osmanc.Sh.ali jawhar d.Sh.ahmedsalaan

2. Yourage:15–24years ☐   25– 33years ☐   34 –43years ☐   above43years

3. Yourmaritalstatus:Single ☐   Married ☐   Widow ☐   Divorced

4. Your highest levelof education: Primary ☐   Secondary ☐   University Others ☐

PartII: Sanitation
1. Wheredo yougetwaterfordomesticuse?

   a. Open well ☐   b. Tap ☐   c.others----------------------------

2. Do youtreatwaterbefore drinking?

a. Yes ☐   b. No ☐

3. Ifyeswhichoneofthesedo youuse?

   a. Boil ☐   .Filter ☐   c.Use ofchemicals ☐

   d. Nothing ☐   e.Other (specify.......................................

4. Doyouwashyourhands?

    a).Yes ⬚   b. No ⬚

5. Ifyes,onwhatoccasionsdo youusuallywashyourhands,(tickallthatapply)

    a. Before eating ⬚   b.Afterdefecating ⬚

    c.Beforefeedingthebaby ⬚   d.Beforebreastfeeding ⬚

    e.Aftercleaningbaby¨sbottom ⬚   .others(specify)---------------

6. Doyou usesoapwhenwashinghands?

    a.   Yes ⬚   b. No ⬚

7. Ifyes,onwhatoccasionsyouusuallyusesoap whenwashinghands?

    a.   Before eating ⬚   b.Afterdefecating ⬚

    c.Before feedingthebaby ⬚   d.Beforebreastfeeding ⬚

    e.Aftercleaningbaby'sbottom ⬚   others (specify)---------------

8. Do youhave toilet?

    a.   Yes ⬚   b. No ⬚

9. Ifyes,whattypeoftoiletdo youhave?

    a.   Ventilatedimprovedpit ⬚   b.Traditionalpitlatrine ⬚   c.lushtoilet ⬚   d.others----------

10. Howdo youdispose refuse at your home?

    a.   Burn,Buryorputin thedust bin ⬚

    b.   Throwinthebush ⬚

    c.   Others(specify)----------

PartIII:Mothers'Socioeconomic Characteristics
1. Doyouwork

    a.   Yes ⬚   b. No ⬚

    2.   If yes,wheredoyouwork?

    .a.Government   b. Organization   c. Yourownbusiness   d.   Others(Specify)

    3.   Howmanyhoursdoyouworkperday?

    a.5 hrs   b.8hrs   c.10 hrs Othersspecify-------------

    4.   HouseholdSize(persons)   a. 2-4 b.   5-7   c.   7above

PartIV:Feeding Practices
1. Doyoubreastfeeding your child?

    a.   Yes   .No

2. If yes,whendid youstartbreastfeedingtoyourchild?

    a.   Theveryfirst dayafter delivery

    b.   Theseconddday

    c.   Thethirdday

    d.   Thefourthday

    e.   Others(specify)…………..

2.   Ifbreastfeedingbeganondayone,pleaseindicatethehoursafterdelivery breastfeeding commenced?
a.   Within30minutesafter birth

b.   Withinonehourafterbirth
c.   Withintwohoursafter birth
d.   Others…………

3.   Do yougivethechildbreastmilkanytimethechildasksfor?
a.   Yes

b.   No.

4.   Doyou giveyourchildlocalcomplementaryfoods?
a.   Yes   b. No

5.   Ifyes,whatlocalcomplimentaryfoodshaveyouintroducedtoyour child?
a.   Rice   . spaghetti   c. Others (specify)------------

6.   Howmanytimesdoyougivethe child complementaryfoods perday?

    a.   2 times

    b.   3 times

    c.   4 times

7.   Doyounormallygivethechildsnackinbetweenthemainmeals?

    a.   Yes   . No

8.   Hasthechild been sickin thepast one-month?
    a.Yes   No

9.   Ifthechildwassick,wheredidyouseektreatment?

    a. Hospital   b.Boughtdrug(chemistordrugstore) c. traditional healers
    d. Other   (specify

10.   Doyouincreasefeedingwhenthechildis sick?

a.   Yes   b. No

PART 5: Nutritional Status of the Children
1.   Whatisthenutritionalstatusofthechild?

    a)   Normal b)Malnourished

2.   Whatis thewastingstatusofthechild?

    a)   Wasted b)Normal

3.   Whatistheweight /ageofthechild?

    a)   Underweight   b)Normal

4.   Whatistheage/heightof the child?
   a)   Normal b)Stunted

TABLEOFSAMPLES

No.	MCHs	Numberof Children	Samplesize
1	Central	100	49
2	SheikhOsman	100	49
3	SheikhAli	100	49
4	Qoorgaab	100	49
		400	196

APPENDIX VI
TABLEOFSAMPLESIZE

Population	SampleSizeat		Confidence=95%		SampleSizeat		Confidence=99%	
	Margin of Error –Percent				Margin of Error–Percent			
	5.0	3.5	2.5	1.0	5.0	3.5	2.5	1.0
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1176	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586

Source: Krejcie&Morgan,1970

APPENDIXVII
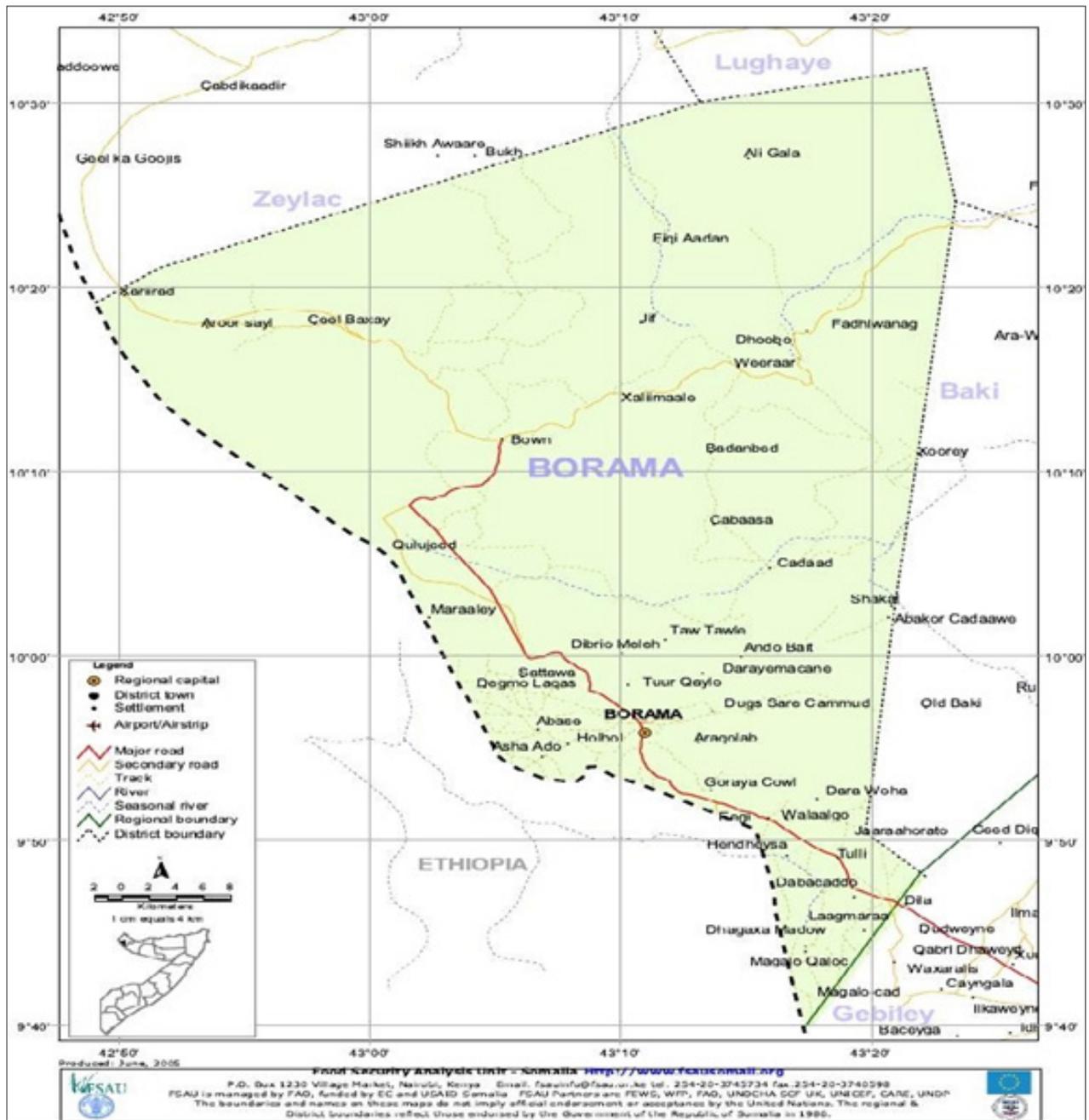
MAPOF BORAMA
Adoptedfrom(Googleearth,2017)
VALIDITYMEASUREMENTCOMPARISONSFORJUDGES

ITEM	JUDGE1	JUDGE2	Decision
1	4	4	R
2	4	4	R
3	4	4	R
4	4	4	R
5	4	4	R
6	4	4	R
7	4	4	R
8	4	4	R
9	4	4	R

10	4	4	R
11	4	4	R
12	4	4	R
13	4	4	R
14	4	3	R
15	4	4	R
16	1	4	NR
17	4	4	R
18	4	4	R
19	4	3	R
20	4	4	R
21	4	4	R
22	4	4	R
23	4	4	R
24	4	3	R
25	4	4	
26	4	3	NR
27	4	4	R
28	4	4	R
29	4	4	R
30	3	4	NR
31	3	4	NR
32	3	4	NR
33	3	4	NR

APPENDIX IX

NO	RESPONDENTS 1(T1)	RESPONDENT 2(T2)
1	33	35
2	33	30
3	33	31
4	33	39
5	33	34
6	33	30
7	33	32
8	33	31
9	33	33
10	33	38
11	33	34
12	33	34
13	33	35
14	33	35
15	33	34
16	33	36
17	33	36
18	33	32
19	33	33
20	33	34
21	33	35
22	33	39

23	33	37
24	33	31
25	33	36
26	33	34
27	33	
29		
28	33	40
30	33	30
31	33	39
32	33	34
33	33	31
total	1089	1091

as $Y = 1 - \frac{T2 - \sum T1}{\sum T1}$, is total of test1 scores and T2 is the total of Test 2 scores

Appendix 9: Research Data

Respondent	Residence	Age	MaritalStatus	Level of Education	Sanitation	Mother's Socioeconomic Characteristics	Feeding Practices
1	1	1	2	1	27	11	24
2	1	2	2	2	26	9	29
3	1	2	2	2	27	9	24
4	1	1	2	1	25	2	26
5	1	2	2	1	27	4	25
6	1	2	2	3	33	12	19
7	1	1	2	3	24	8	20
8	1	3	2	3	29	8	22
9	1	2	2	4	26	4	20
10	1	1	2	1	24	8	22
11	1	1	2	4	22	4	17
12	1	1	2	4	18	3	20
13	1	2	2	4	23	11	17
14	1	3	2	4	25	9	23
15	1	2	2	4	17	4	19
16	1	3	2	4	16	3	27
17	1	2	2	4	25	2	11
18	1	1	2	4	26	4	14
19	1	2	2	4	33	9	21
20	1	3	2	4	23	9	15
21	1	2	2	4	21	11	27
22	1	3	2	1	27	2	20
23	1	1	2	1	28	11	21
24	1	2	2	1	28	4	27
25	1	2	2	1	24	2	19
26	1	1	2	2	31	10	21
27	1	2	2	1	28	3	18
28	1	2	2	1	24	10	22

29	1	2	2	4	16	9	21
30	1	2	2	1	31	12	28
31	1	2	2	2	20	3	23
32	1	1	2	3	24	4	17
33	1	3	2	1	26	2	21
34	1	1	2	4	27	10	22
35	1	2	2	1	25	3	17
36	1	1	2	3	20	4	18
37	1	3	2	2	31	10	22
38	1	2	2	1	18	2	20
39	1	3	2	2	31	9	21
40	1	1	2	2	27	7	17
41	1	2	2	1	25	2	16
42	1	3	2	2	22	2	20
43	1	2	2	1	30	9	28
44	1	1	2	1	24	3	27
45	1	1	2	1	31	3	25
46	1	2	2	1	25	11	21
47	1	3	2	1	25	9	15
48	1	2	2	1	16	3	25
49	1	1	2	1	26	3	23
50	2	2	2	1	21	9	25
51	2	3	4	4	29	9	21
52	2	3	2	1	31	4	20
53	2	1	2	4	27	10	18
54	2	3	4	1	21	10	25
55	2	3	2	1	33	9	18
56	2	1	2	1	21	8	20
57	2	3	2	2	24	9	23
58	2	2	2	1	22	12	20
59	2	2	2	1	24	8	22
60	2	1	2	4	25	4	17
61	2	2	2	1	22	3	20
62	2	2	2	1	29	10	19
63	2	2	2	1	23	9	
64	2	3	2	1	26	3	
65	2	2	2	1	31	10	
66	2	1	2	1	22	10	
67	2	2	2	1	32	10	
68	2	3	2	1	20	9	
69	2	3	2	1	32	8	
70	2	3	2	1	25	2	
71	2	1	2	1	26	9	
72	2	2	2	1	24	11	
73	2	2	2	2	23	9	
74	2	1	2	1	26	9	
75	2	2	2	1	33	9	
76	2	2	2	2	29	8	
77	2	1	2	1	22	10	

78	2	2	2	1	19	9	
79	2	2	2	1	29	10	
80	2	1	2	1	20	4	
81	2	3	2	2	25	11	
82	2	1	2	1	27	2	
83	2	2	2	2	26	3	
84	2	1	2	1	25	2	
85	2	3	2	1	25	10	
86	2	2	2	1	22	2	
87	2	3	2	4	19	10	
112	3	1	2	2	17	8	9
113	3	1	2	1	18	2	12
114	3	1	2	1	26	2	15
115	3	2	2	1	28	9	10
116	3	3	2	4	21	3	12
117	3	2	2	2	18	4	15
118	3	2	2	2	24	8	11
119	3	2	2	2	18	9	16
120	3	1	2	1	17	2	8
121	3	3	2	4	34	3	15
122	3	2	2	2	20	7	8
	3	2	2	4	22	8	
123	3	2	2	4	20	3	16
124	3	2	2	2	34	10	15
125	3	2	2	4	28	3	12
126	3	1	2	2	17	8	12
112	3	1	2	2	32	3	16
127	3	2	3	1	17	11	15
128	3	2	2	3	17	9	16
129	3	1	2	1	19	9	16
130	3	2	2	4	24	2	12
131	3	2	2	4	23	4	8
132	3	3	2	4	31	2	12
133	3	1	2	4	34	3	15
134	3	3	2	1	26	9	16
135	3	1	2	1	17	4	15
136	3	2	4	4	26	8	16
137	3	2	2	2	17	3	15
138	3	3	2	4	19	2	16
139	3	3	2	1	19	9	16
140	1	1	2	1	27	11	24
141	1	2	2	2	26	9	29
142	1	2	2	2	27	9	24
143	1	1	2	1	25	2	26
144	1	2	2	1	27	4	25
145	1	2	2	3	33	12	19
146	1	1	2	3	24	8	20
147	1	3	2	3	29	8	22
148	1	2	2	4	26	4	20

149	1	1	2	1	24	8	22
150	1	1	2	4	22	4	17
151	1	1	2	4	18	3	20
152	1	2	2	4	23	11	17
153	1	1	2	1	27	11	24
154	4	1	2	1	35	8	9
155	4	2	2	1	32	9	12
156	4	3	2	4	31	9	15
157	4	1	2	4	32	7	10
158	4	1	2	1	29	2	12
159	4	3	2	4	35	9	15
160	4	2	2	1	32	9	11
161	4	2	2	4	31	8	16
162	4	1	2	1	35	8	8
163	4	2	2	1	32	9	15
164	4	3	2	4	31	9	8
165	4	1	2	4	32	7	16
167	4	1	2	1	29	2	15
168	4	3	2	4	35	9	12
169	4	2	2	1	32	9	12
170	4	2	2	4	31	8	16
171	4	1	2	1	35	8	15
172	4	2	2	1	32	9	16
173	4	3	2	4	31	9	16
174	4	1	2	4	32	7	12
175	4	1	2	1	29	2	8
176	4	3	2	4	35	9	12
177	4	2	2	1	32	9	15

Appendix 10: Approval Letter

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