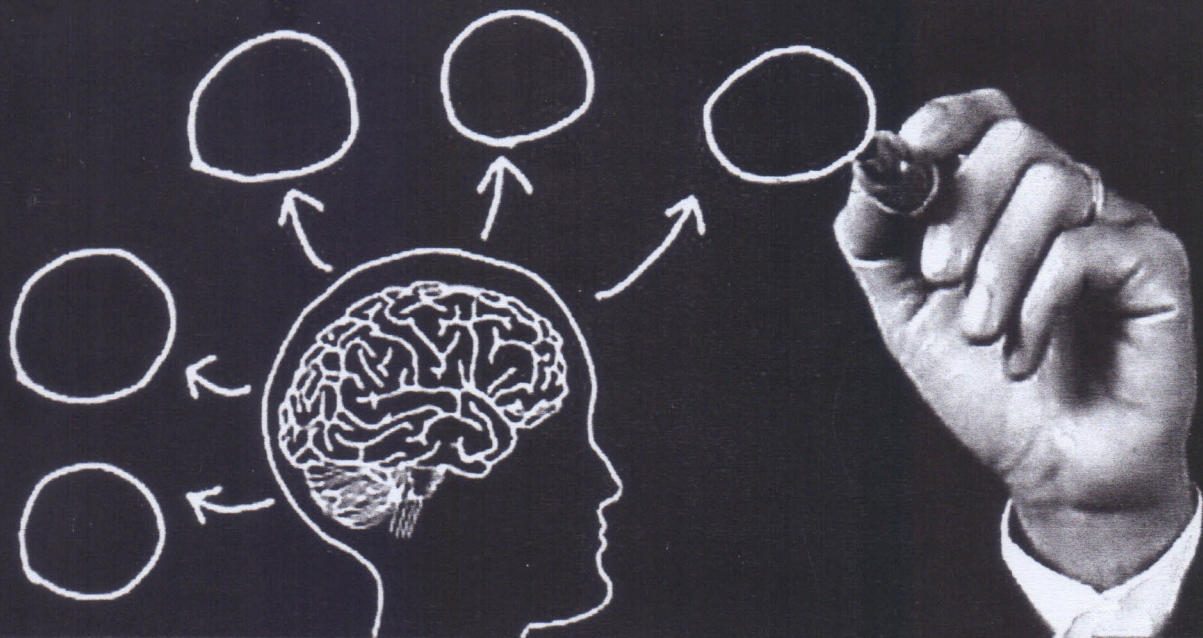




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Assessment of Nutritional Status of Children 0 – 2years and Associated Factors in Some Selected Primary Health Centres in Osun State

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Abstract

This study assessed the nutritional status of children under 0 – 2 years using anthropometric measurement approach in selected primary Health Centers (PHC) in Ife North Local Government of Area of Osun State and identified mothers' perceived factors that influenced nutritional status these children. It also investigated the feeding practices engaged by mothers of 0-2 children.

A descriptive cross-sectional study that targeted a population of 200 mothers with children 0 – 2 years attending the selected PHCs used a simple random sampling technique to select a sample size of 160 mothers using Slovin's formula. Weighing scale, stadiometer, and Shakir's tape were used to get data from 0 – 2 children while a self-structured questionnaire was used to collect data from mothers of these children. Face and content validity of the questionnaire were ensured by experts in related research field with a mean reliability coefficient of 0.66 using the test re-test method. Data collected were analyzed using Emergency Nutrition Assessment for Standardized Monitoring and Assessment of Relief and Transition (ENA for SMART) software and Statistical Package for Social Sciences (SPSS) version 20. The research hypotheses were tested using chi square at 5% level of significance.

The study revealed that underweight (8.8%), stunting (9.4%) and wasting (6.9%) were found among the children. Furthermore, lack of readily available nutritional food, lack of money to buy adequate food, inability of child to eat his or her food well, stringent work schedule and husbands being the only source of income were major factors identified as hindering the nutritional status of the children. About 91.2% of the mothers practiced exclusive breastfeeding and 23.8% used locally available food as complementary feeding after exclusively breastfeeding their children.

It is recommended that government authorities should organize women empowerment programmes on skills acquisition to help them to be self-reliance.

Keywords: Nutritional status, Assessment, Breastfeeding, Exclusive breastfeeding, complementary feeding

Introduction

Nutritional status is the balance between the intake of nutrients by an individual and the utilization of these nutrients in the process of growth, development and health maintenance. Adegun, et. al., (2013) asserted that the nutritional status of young children greatly depends on intake of adequate and appropriate nutrients and the ability of the body to utilize the nutrients for its proper functioning. Children under 5 largely depend on their parents/carers for their nutrition and when there is a mismatch between nutritional intake and its utilization in the body, malnutrition results. Malnutrition can be under nutrition or over nutrition. It can be caused by deficiencies, excesses, imbalances in an individual's consumption of nutrients. One of the major health problem faced by children in developing countries today is under-nutrition (Galgamuwa, et. al., 2017). Malnutrition in all its forms includes under-nutrition (wasting, stunting, and underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases (WHO, 2018). Malnutrition is a global problem and its burden is unacceptably high. It takes its toll on anyone irrespective of color, region, creed, or socio economic class. Malnutrition in children is very critical especially amongst infants 0 -2 years because poor nutritional status mostly among young children has negative impact on their growth and development.

In 2018, the global under-5 death rate was 39 deaths per 1,000 live births with over 5million deaths (WHO, 2018). Unfortunately, Sub-Saharan Africa accounts for the highest under-5 mortality rate globally, with reports that India and Nigeria alone contribute about one third of this global burden. According to World Health Organization WHO, (2018), about 45% of deaths among children under-five years of age are linked to under-nutrition and mostly occur in low and middle-income countries. The recent global malnutrition estimates by the United Nations Children's Emergency Funds (UNICEF), World Health Organization (WHO), and the World Bank among children under 5 is alarming; over 140million are stunted, 47million are wasting, and about 38million are overweight. In children under 5 years, stunting accounts for 21.3%, wasting 6.9% while overweight is 5.6% (UNICEF, et al., 2019). The impact of malnutrition can be colossal. About 45% of deaths in children under-5 years of age is attributable to nutrition-related factors. Malnourished children particularly those with severe acute malnutrition, have a higher risk of death from common childhood illness such as diarrhoea, pneumonia and malaria (WHO 2018).

One of the major approaches that help in identifying nutritional risk indicator is screening. Nutritional assessments help in collecting necessary information that can help to confirm any nutrition related problem. Dao, et. al. (2019) asserted that nutrition assessment involves in-depth collection and analysis of anthropometric measurements, dietary consumption, clinical or medical history, feeding practices, and biochemical or laboratory data. The most widely and easily used nutrition indicator in community settings to determine the level of malnutrition in young children especially the under-five years of age is Anthropometric indices which include the measurement of weight for age, height for age, weight for height and measurement of mid-upper arm circumference (MUAC). Badake, et. al., (2014), posited that assessing the growth of children is a good parameter to look at the development of the children and this also gives insight about food security in the area and access to good health services. More so, health status has been acclaimed a vital predictor of a child's survival (Bhandari & Chhetri, 2013).

Factors influencing nutritional status of children 0 – 2years vary in different climes and among mothers. Yasoda-Devi and Geervani (2016) found maternal and socio-economic factors to be part of the determinants of the nutritional status of the under-five. Bhandari and Chhetri (2013) identified age of the mother, exclusive breast feeding, socio-economic status, birth order, early recommended supplementary foods, gap more than two years between two pregnancies, timely seeking of medical care, and complete immunization as factors influencing nutritional status of infants. Ndukwu, et. al., (2013) found out that environmental and socioeconomic factors were the major determinants. One study found that gender (males), above two deliveries, increased household size, inadequate meal consumption in a day, and environmental factors were significantly associated with nutritional status of the under-five in Ethiopia (Degarege, et. al., 2015).

According to Maitanmi and Maitanmi (2017); growth and development of the under-five depend majorly on the interactions between the identified factors. Relevant stakeholders can develop evidence-based interventions that is focus on modifying and addressing these factors and ensuring that children 0 -2years lead a healthy living that promotes growth and all round development. It therefore becomes imperative to assess the factors influencing nutritional status of children 0 – 2years. The study will also describe the breastfeeding and complementary practices of mothers and assess the nutritional status of under-two children.

Materials and Methods

This study utilized a descriptive survey design that was carried out in the infant welfare clinics of 4 purposively selected primary healthcare centers in Ife North Local Government of Osun State, Nigeria. Ife North is one of the 30 Local Government Areas in Osun State with her headquarters in Ipetumodu and the total population of 153,694. There are about thirty Government's Health Facilities in the local government area, however, the study settings (comprehensive health center Ipetu, primary healthcare center Moro, primary healthcare center Yakoooyo, and Okoko primary healthcare center) were purposively selected because they are fully functional and have high patient flow. An average of 400 Mothers and their infants 0 – 2 years who attend the infant welfare clinic comprised this population. The sample size of 200 mothers and infants 0 – 2years was obtained through Slovin's formula as shown; $n = \frac{N}{1 + N e^2}$ (where n = minimum sample size, N = Target population, e = sampling error set at 0.05). Data collection was done through

observation and the use of self-structured questionnaire. The observation involved a direct nutritional assessment (anthropometric measurements) of children 0 – 2years using the weighing scale, Shakir's tape, and the stadiometer. An observational checklist that contained 4 items on Anthropometric measurement of 0-2 children was used to gather the data. A self-structured questionnaire, a weighing scale, Shakir's tape/MUAC tape, a tape measure and observational checklist guide were used to collect information from the mothers. The self-structured questionnaire had three sections with 45 items. Section A contained socio-demographic data with 8 items. Section B contains 26 items on nutritional practices that mothers engaged in to feed their infants. Section C consists of 11 items to that elicited information on the factors that influence the nutritional status of 0-2 children.

The questionnaire was structured after an extensive literature review and was subjected to expert's review and corrections to assure its face and content validity. The questionnaire was then tested for reliability using Cronbach's Alpha after administering 30 copies to mother and infants attending infant welfare clinic at primary health centre, Obafemi Awolowo University, Ile-Ife, Osun State. The alpha coefficient for the items on the questionnaire was 0.675. An introduction letter was submitted to the Babcock University Health Research Ethics Committee (BUHREC) who subsequently gave ethical clearance for the study. Permission was sought from the Medical officers in charge/chief matrons in charge of the selected primary health care centres after submitting a copy of the introduction letter and the ethical clearance. Verbal and written informed consent was also gained from the respondents after adequate explanation of the purpose of the research and information to be collected. They were assured that the instruments to be used will not cause harm to their babies and data will be treated with confidentiality. Two student nurses served as research assistance after they were trained for two days on the data collection process and the filling of the questionnaire.

Nutritional status of the children was estimated in terms of weight for age, length for age and weight for length using the WHO standard as cited by Sutan, et. al. (2018). With regards to weight of age grading, severely underweight (≤ 6.3), underweight (6.4 - 6.9), normal weight (7.0 - 11.5) and overweight (≥ 11.6). The length of age: severely stunted (≤ 66.2); stunted (66.3 - 68.8), normal length (68.9 - 79.2) and tall (79.3). With respect to weight for length: severely wasted (≤ 7.1), wasted (7.2 - 7.7), normal (7.8 - 11.2), overweight (11.3 - 12.4) and obese (12.5). The data collected was analysed by using Statistical Product Service Solution (SPSS) version 23.0 for data analysis and results were summarized using descriptive statistics of simple percentage. Hypotheses were tested with chi-square test at 95% confidence interval after the variables were categorized.

Results

Out of the 200 questionnaire distributed, a total of 160 was duly completed and retrieved given a response rate of 80%.

Socio-demographic characteristics

Table 1 below shows the socio-demographic data of respondents. Majority of the mothers were within the age range of 20-30 years, 71.2% of the respondents were Christians. 89.4% of the respondents were married. Majority of the respondents had secondary education as their highest level of education with 48.8%. 51.9% of the respondents were self-employed and majority of the respondents source their daily income from trading activities with 46.2%. Also, 89.4% of the respondents fall into the #50 - #900 food cost group.

Nutritional status of 0-2 children

The nutritional status of 0 – 2 children was measured in terms of weight for age, length for age, and weight for length. Table 2 below shows the data gotten from the direct assessment of these anthropometric measures. With regards to weight of age, majority of the respondents 107 (66.6%) are normal weight (7.0 - 11.5), while others; 28 (17.5%) are severely underweight (≤ 6.3), 14 (8.8%) underweight (6.4 - 6.9) and 11 (6.9%) are overweight (11.6). The length of age shows that majority 85 (53.1%) are of normal length. However, 42 (26.2%) are severely stunted (≤ 66.2); 15 (9.4%) are stunted (66.3 - 68.8), while 18 (11.2%) of the respondents are tall (79.3). With respect to weight for length, majority of the respondents 119 (74.4%) are normal (7.8 - 11.2), 10 (6.2%) are severely wasted (≤ 7.1), 11 (6.9%) were wasted (7.2 - 7.7), 5 (3.1%) overweight (11.3 - 12.4) while 15 (9.4%) of the respondents are obese (12.5).

Table 1: Socio-demographic data of respondents		n = 160
Socio-Demographics Data	Frequency	Percent
Mothers' Age (in years)		
20 - 30	103	64.4
31 - 40	52	32.5
41- 50	5	3.1
Religion		
Christian	114	71.3
Muslim	45	28.1
Traditional	1	0.6
Marital Status		
Single	4	2.5
Married	143	89.3
Divorce	7	4.4
Widow	6	3.8
Educational Level		
No formal education	16	10.0

Socio-Demographics Data	Frequency	Percent
Primary school	7	4.4
Secondary school	78	48.7
Diploma	30	18.8
Degree	29	18.1
Occupation		
Employed	139	86.9
Unemployed	21	13.1
Food Cost Group		
50 - 900 Naira	143	89.4
1000 - 4000 Naira	14	8.8
5000 - 8000 Naira	3	1.9

Field Survey, 2020

Table 2: Nutritional Status of Mothers' Children (n = 160)

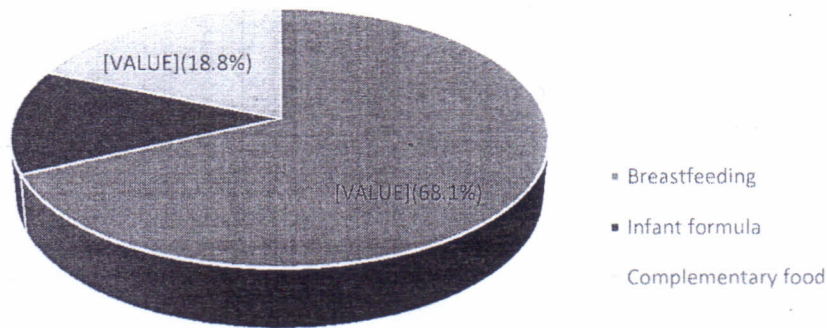
Nutritional Status of Children	Frequency	Percent
Weight for Age		
Severely Underweight (≤ 6.3)	28	17.5
Underweight (6.4 - 6.9)	14	8.8
Normal (7.0 - 11.5)	107	66.9
Overweight (≥ 11.6)	11	6.9
Length for Age		
Severely Stunted (≤ 66.2)	42	26.2
Stunted (66.3 - 68.8)	15	9.4
Normal (68.9 - 79.2)	85	53.1
Tall (≥ 79.3)	18	11.2
Weight for Length		
Severely Wasted (≤ 7.1)	10	6.2
Wasted (7.2 - 7.7)	11	6.9
Normal (7.8 - 11.2)	119	74.4
Overweight (≥ 11.3 - 12.4)	5	3.1
Obese (≥ 12.5)	15	9.4

Field Survey, 2020

Feeding Practices Engaged by Mothers of 0-2 Children

The feeding practices that mothers involve in are discussed in terms of practices relating to breastfeeding, infant formula and complementary feed. Figure 1 shows that majority 109(68.1%) breastfed their babies, 30(18.8%) fed with complementary foods, while 21(13.1%) used infant formula. Table 3 shows breastfeeding practices of respondents of which majority 146(91.2%) had practiced exclusive breastfeeding while 144(90%) fed child directly from breast. Table 4 shows that 38(23.8%) of the respondents introduced locally available foods while 35(21.9%)

introduced formula feeds, 21(13.1%) introduced soya beans while 62(38.8%) did not respond. With respect to the commencement of complementary feeding, majority of the respondents 82(51.2%) introduced it at 6 months, while 51(31.9%) commenced at 7-8 months. Furthermore, 28(17.5%) introduced pap, 10(6.2%) introduced soya beans and *Loya* milk while 6(3.8%) introduced local food.



Field Survey, 2020: Figure 1: Types of Food Used in Feeding Babies

Table 3: Respondents' breastfeeding practices (n = 160)		
Items	Frequency	Percent
Practice of exclusive breastfeeding		
Practiced Exclusive breastfeeding	146	91.2
Never practiced exclusive breastfeeding	14	8.8
How child is breastfed		
Directly from breast	144	90
Express breast milk using spoon	3	1.9
Expressed breast milk using feeding bottle	13	8.1
Total	160	100

Field Survey, 2020

Table 4: Respondents' Complementary feeding practices (n = 160)

Items	Frequency	Percent
Types of Complementary Feed		
Declined response	62	38.8
Formula feeds	35	21.9
soya beans	21	13.1
Locally available foods	38	23.8
Custard	2	1.2
Indomie & fish	1	0.6
Pap	1	0.6
Child's Age At Commencement of Complementary Feeding		
3 Month	4	2.5
4 Month	4	2.5
5 Month	19	11.9
6 Month	82	51.2
7-8 Month	51	31.9
Feeds introduced first		
Declined response	105	65.6
Pap	28	17.5
Soya bean & Loya milk	10	6.2
Local food	6	3.8
Nan	2	1.2
Formula	5	3.1
Indomie	1	0.6
Okababa (millet corn pap)	1	0.6
Corn flakes	1	0.6
Hot water	1	0.6

Field Survey, 2020

Perceived Factors that influence the nutritional status of 0 – 2 children

This section discusses the factors that influence the nutritional status of children 0 – 2 years from mothers' perspective. Nine items were presented on a table on 2-point scale of Yes or No. Table 5 shows mother's responses on factors influencing nutritional status of children age 0-2. Result shows that 22(13.8%) of the participants implicated lack of nutritious food in their area, 21(13.1%) lack of money to buy adequate food for their child, 20(12.5%) inability of child to eat his or her food well, 19(11.9%) stringent work schedule, and 18(11.2%) husband being the only source of income as major factors influencing their children's nutritional status.

Table 5: Perceived Factors Influencing Nutritional Status of Children Age 0 – 2 (N = 160)

Items	YES		NO	
	Freq.	%	Freq.	%
Lack knowledge about how to feed my child properly	15	9.4	145	90.6
Child does not eat his/her food well	20	12.5	140	87.5
Lack knowledge of type of food to feed child	17	10.6	143	89.4
Child often has fever, diarrhea or cough	11	6.9	149	93.1
Nutritious foods are not readily available in my area	22	13.8	138	86.2
Started giving child local food < 6months	13	8.1	147	91.9
Stringent work schedule	19	11.9	141	88.1
Lack enough money to buy adequate food for child	21	13.1	139	86.9
Husband alone responsible for family income	18	11.2	142	88.8
We have food taboos in my family	11	6.9	149	93.1
My religion forbids the eating of certain food	9	5.6	151	94.4

Field Survey, 2020

Testing of Hypotheses

Hypothesis 1: There is no significant association between Breastfeeding type and Child's Nutritional Status

Table 6: Association between Breastfeeding type and Child's Nutritional Status
n=160

Variables of nutritional status	Breastfeeding type		Chi-square	Degree of freedom	p-value	Remarks
	Not exclusively breastfed	Exclusively breastfed				
Weight for Length						
Severely Wasted	0 (0.0%)	10 (100%)	7.93	4	0.09	NS
Wasted	3 (27.3%)	8 (72.7%)				
Normal	10 (8.4%)	109 (91.6%)				
Overweight	1 (20.0%)	4 (80%)				
Obese	0 (0.0%)	15 (100%)				
Length for Age						
Severely Stunted	5 (11.9%)	37 (88.1%)	2.38	3	0.50	NS
Stunted	1 (6.7%)	14 (93.3%)				
Normal	8 (9.4%)	77 (90.6%)				
Tall	0 (0.0%)	18 (100%)				
Weight for Age						
Severely Underweight	4 (14.3%)	24 (85.7%)	2.88	3	0.41	NS
Underweight	2 (14.3%)	12 (85.7%)				
Normal	8 (7.5%)	99 (92.5%)				
Overweight	0 (0.0%)	11 (100%)				

NS = Not Significant

Tables 6 shows that there was no significant association between the breastfeeding type and child's nutritional status ($p > 0.05$). Therefore the null-hypothesis was not rejected.

Hypothesis 2: There is no significant association between mothers' employment status and child's nutritional status

Table 7: Association between Employment status and Child's Nutritional Status
n=160

Variables of nutritional status	Employment status		Chi-square	Degree of freedom	p-value	Remarks
	Employed	Unemployed				
Weight for Length						
Severely Wasted	7 (70.0%)	3 (30%)	5.69	4	0.22	NS
Wasted	8 (72.7%)	3 (27.3%)				
Normal	106 (89.1%)	13 (10.9%)				
Overweight	5 (100.0%)	0 (0.0%)				
Obese	13 (86.7%)	2 (13.3%)				
Length for Age						
Severely Stunted	37 (88.1%)	5 (11.9%)	0.19	3	0.98	NS
Stunted	13 (86.7%)	2 (13.3%)				
Normal	73 (85.9%)	12 (14.1%)				
Tall	16 (88.9%)	2 (11.1%)				
Weight for Age						
Severely Underweight	25 (89.3%)	3 (10.7%)	0.39	3	0.94	NS
Underweight	12 (85.7%)	2 (14.3%)				
Normal	92 (86.0%)	15 (14.0%)				
Overweight	10 (90.9%)	1 (9.1%)				

NS = Not Significant

Table 7 show that there was no significant association between mothers' employment status and child's nutritional status ($p > 0.05$). Therefore, the null-hypothesis was not rejected.

Discussion

Findings showed that approximately two-third of the respondents are normal weight, with less than one-fifth being severely underweight (≤ 6.3). It was reported that 8.8% of the respondents are underweight while about 6.9% are overweight. This result is expected because most mothers in the study reported practicing exclusive breastfeeding with complementary feeds introduced at appropriate time. However, the number of children who are severely underweight and underweight is worrisome. The result of this study that showed 8.8% being underweight is similar with that reported by Akorede and Abiola (2013) where 8.5% of the respondents were found to be underweight. In contrast, a higher prevalence have been reported by other studies with figures of 11.8% in Nairobi (Olack, et. al., 2011) and 15.9% in Addis Ababa, Ethiopia (Degarege, et. al., 2015), 18.1% in Kenya (Badake, et. al., 2014), 21% in Pakistan (Hassan, et. al., 2010) and 22% in Kwara State (Babatunde, et. al., 2011). Findings regarding the length of Age showed that 26.2% are severely stunted while 9.4% are stunted. The proportion of children who are severely stunted/stunted in this study may be attributed to the type of complementary food (pap, soya bean plus loya milk, local food) some mothers feed their infants with during weaning as it cannot be ascertained if food prepared is a balanced diet and/or of nutritive value. However, our findings of 9.4% for stunting is low when compared with other studies as values range from 12.5% to 58.7% (Akorede & Abiola, 2013; Degarege, et. al., 2015; Babatunde, et. al.,

2011; Hassan, et. al., 2010; Badake, et. al., 2014; Olack, et. al., 2008; Mamulwar, et. al., 2014). With respect to weight for length, 6.2% are severely wasted, while 6.9% were wasted. This is similar to the finding of Badake, et. al. (2014) that found about 7.1% prevalence rate of wasting among the under-five. On the contrary, a higher prevalence was reported by Babatunde, et. al., (2011) with wasting accounting for 14.2% among under-five in farming household of Kwara State. Also, Akorede and Abiola (2013) found out that 14.8% wasting level among children in Akure.

Our findings showed that mothers indicated lack of nutritious food in their area, lack of money to buy adequate food for their child, inability of child to eat his or her food well, stringent work schedule, and husband being the only source of income as major factors influencing nutritional status of children age 0-2. Some of the factors indicated in our study have been identified by other researchers. Ndukwu, et. al., (2013) found out that environmental and socioeconomic factors were the major determinants of nutritional status among under-five children. Also, Senthilkumar, et. al. (2018) reported that gender of the child, child birth interval, presence of latrine in the household, age of household head, sex of household head, family size, education of household head, use of treated water, and child's age were associated with the nutritional status of children. Galgamuwa, et. al. (2017) reported that episodes of diarrhea, calorie adequacy of diet, maternal and socio-economic factors are determinants of nutritional status of the under-five. The findings of this study showed that over two-third of the mothers (68.1%) breastfeed their babies, and less than one-fifth feed with complementary food and use infant formula respectively.

A significant proportion (91.2%) had practiced exclusive breastfeeding and feed child directly from breast. Result showed that 23.8% of the respondents prefer to introduce locally available foods as complementary food, 21.9% prefer to introduce formula feeds while 13.1% introduced soya beans. In this study, a little above half of the respondents introduced complementary feed at 6 months, while less than one-third commenced at 7-8 months. Response about first feeds introduced to the child by participant shows that 17.5% of the respondents introduced pap, 6.2% introduced soya beans and loya milk while 3.8% introduced local food. A similar finding has been reported by Alamu, et. al., (2011) who in their study found the rate of exclusive breastfeeding as 72% among mothers who took their under-five children to the clinic with 62% of them introducing complementary feeding at 6months. On the contrary, Akorede and Abiola (2013) found the rate of practice of exclusive breastfeeding among mothers to be 16.7% in Akure South. Though, 23.8% of the respondents used locally available food as complementary food for their children. Badake, et. al., (2014) in their study carried out in Kenya found out that the most popular food consumed by children was found to be cereals.

Our study revealed that there was no significant association between the breastfeeding type and child's nutritional status of 0-2 children and weight for length ($r=0.094$, $p > 0.05$), length for age ($r=0.498$, $p > 0.05$), and weight for age ($r=0.41$, $p > 0.05$) of 0-2 children. This negated the findings of Badake, et. al., (2014) found who found significant differences in the nutritional status between the age groups. Result also showed that there was no significant association between participants' occupation and child's nutritional status of 0-2 children and weight for length ($r=0.224$, $p > 0.05$), length for age ($r=0.979$, $p > 0.05$), and weight for age ($r=0.942$, $p > 0.05$) of 0-2 children. This is in line with the findings of Badake, et. al., (2014) who found no

direct significant associations between household income and the nutritional pointers. Our study concludes that mothers' feeding practices plays a key role in the nutritional status of their infants. The urgent need to therefore empower mothers to take on this crucial role has become a priority. Nurses can help reduce the menace of malnutrition by targeting mothers at infant welfare clinics and organize nutritional programs that would help educate them on preparing adequate nutritious diet from locally available food in the area, hold food demonstration sessions to show the mothers how to prepare food for their children. It is also recommended that government authorities should organize women empowerment programmes that will train mother on skills acquisition and help them to be self-reliance. Provision of loans and financial support to enable them start a business may also prevent them from depending solely on their husband.

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