Research Article

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Journal Of Nursing And Health Studies
ISSN 2574-2825

2019
Vol.4 No.1:2

DOI: 10.36648/2574-2825.1000034

Nurses Knowledge and Awareness towards Severe Acute Malnutrition Management Protocol in Harar, Eastern Ethiopia

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Citation: Oumer A (2019) Nurses Knowledge and Awareness towards Severe Acute Malnutrition Management Protocol in Harar, Eastern Ethiopia. J Nurs Health Stud Vol.4 No.1:2

Abstract

Background: For appropriate management of acute malnutrition skilled, knowledgeable and concerned health professional are mandatory. Thus, assessing the knowledge of nurses towards management protocol of severe acute malnutrition is crucial step for targeted interventions.

Objectives: to assess nurses` knowledge and awareness towards severe acute malnutrition management protocol in Hiwot Fana Specialized University Hospital, Eastern Ethiopia, 2018.

Methods: Cross-sectional study design was conducted among eligible 132 nursing professional from April to June, 2018. Data was conducted using self-administered questionnaire prepared from the national SAM management guideline of Ethiopia revised version 2016. The collected data was analyzed using SPSS version 20.0 software using frequency, tables, graphs, percentages and mean. To compare the knowledge level by various factors t test and analysis of variance with F statistics and P value was computed.

Results: Out of the 23 questions assessing knowledge, 65 (49.2%) had poor knowledge (scored below the mean) and 67 (50.8%) had good knowledge on malnutrition and its managements. The mean knowledge score of nurses was above the average, 53.9 with standard deviation of 14.4 points. More than half, 100 (75.8%) of the nurses had experience in SAM management previously. Males were 1.27 (95% CI: 0.62-2.60) times more odds of being knowledgeable as compared to females. Nurses with the previous experience of managing malnourished child had 1.70 (95% CI: 0.72-4.04) times more likely to be knowledgeable as compared to their counterparts. Having SAM training was associated with having higher knowledge score (AOR=1.56; 95% CI: 0.67-3.61). Having SAM training was found to have significantly higher knowledge score than without training (p=0.034).

Conclusions and recommendations: Generally, the knowledge level of nurses towards SAM management is not satisfactory. Those who ever involved in SAM management, having recent malnutrition training and gender were predictors of high knowledge score. There should be regular capacity building schemes for nurses especially for those who are involved in management of SAM at emergency or SAM unit. Involving experienced clinicians in management of malnutrition is of paramount importance.

Keywords: Nurses; Knowledge; Severe acute malnutrition children; Management

Abbreviations: CMAM: Community Management of Acute Malnutrition; CHW: Community Health Workers; DALYs: Disability Adjusted Life Years; EFMOH: Ethiopia Federal Ministry of Health; FDRE-Federal Democratic Republic of Ethiopia; GDP: Gross Domestic Product; HFA: Height-for-Age; HFSUH: Hiwot Fana Specialized University Hospital; HNRS: Harari National Regional State; IRB: Institutional Review Board; S/MAM: Severe/Moderate Acute Malnutrition; MUAC: Mid Upper Arm Circumference; NCHS: National Center for Health Statistics; ORS: Oral Rehydration Salts; RUTF: Ready to Use Therapeutic Food; UNICEF: United Nations Children`s Fund; WFH: Weight-for-Height; WHO: World Health Organization.

Received: January 19, 2019; **Accepted:** March 08, 2019; **Published:** March 15, 2019

Introduction

Severe acute malnutrition is diagnosed by very low weight for height (below-3 z scores or below 70%), visible severe wasting, or by the presence of nutritional Edema or arm circumference below 11 cm [1]. It results from sudden period of food shortage and is associated with a loss of body fat and wasting of muscle mass. Clinically it present in three forms namely marasmus, kwashiorkor or marasmic kwashiorkor [2].

Currently around 52 million children are wasted globally with estimated magnitude of SAM 19 million. In Africa about 7% of children are wasted [3], which far from 2025 target to achieve wasting below 5% [4]. As of the 2016 estimate, globally 7.5% of children suffered from wasting, which is far from the Sustainable Development goal of below 5%.

As the physiological system of malnourished children is significantly reduced by the principle of reductive adaptation the consequences of maltreatment is greater than the natural course. SAM significantly affects child survival, countries economic productivity, long-term cognitive decline and other negative health consequences. Successful management of the severely malnourished patients requires that both medical and social problems be recognized and corrected. For effective and successful management, it requires that each child be treated with proper care and affection in addition to nutritional therapy (F75, F100 and RUTF) and treatment of Medical complications [5].

As the management is different from well-nourished children in the protocol, in appropriate management is common among non-trained individuals. For example reported from Mali showed that only 79·5% of cases were correctly assessed, classified and treated and correctly managed by nurses. While significant number of children were not treated according to the guideline [6]. This may have great impact on the current burden of SAM on under-five mortality and child survival.

SAM causes significant number of mortality among malnourished children. But with the correct implementation of the national SAM guideline using the ten principles of SAM treatment can reduce mortality and improve recovery. In Ethiopian context where CMAM is implemented with four target-oriented programs, Nurse Professionals are the major contributors of SAM management stating from screening to impatient SAM management. Especially in specialized health facilities where impatient facility is established and treatment of complicated cases of malnutrition are treated health professional knowledge on SAM management protocol is essential to ensure adherence to the appropriate treatment.

Even if there many facility related factors that pose significant risk on low treatment effectiveness among SAM children, lack of appropriate skills and training of health professional pose significant negative influences [7]. As the treatment of SAM is integrated management of both nutritional deficiency and medical co morbidities, health professional need to be aware and cable to give appropriate care for SAM children [8]. With the existing significant effort, there is significant decline in mortality from SAM 55% to below 20% the mortality rate attributable to various causes is still high. Among this in appropriate implementation of SAM protocol in particular setting by health care providers is of significant value.

This study tried to assess the knowledge and perceptions of Nurses towards national management protocols of for children 2016 version. It will give a valuable information on any gaps in skills and training of health professionals more specifically on malnutrition. This allows the hospital and regional Health bureau for appropriate programs and training to increase the nurse's technical knowledge and skill in the management of malnutrition according to the guideline.

Objectives of the Study

To assess correlates of nurse's knowledge towards SAM management protocol among in Hiwot Fana Specialized University Hospital, Eastern Ethiopia, 2018.

Methods

Study area

The study was conducted in HFSUH in Harari town. The region has about five hospitals and numerous health centers and Health posts delivery comprehensive primary health care to the community. The city is located 526 Km from the capital Addis Ababa. It has two government Hospitals, Federal Police Hospital, two private Hospitals, eight Health Centers and many private clinics serving the people of the state.

HFSUH is one of the two government Hospitals with a total of 1000 staffs among these 600 of them are health care professionals and 200 are nurses. The hospital, apart from giving daily different medical services including management of different forms of malnutrition including SAM.

Study Design and Period

Institutional based cross-sectional study were used to assess nurses` knowledge on SAM management protocol in 2018.

Populations and Eligibility Criteria

All nurse professionals in HFSUH that are physically present during the data collection period were included in the survey while all nurses in HFSUH (estimated 200) were our source population. Those who were in annual leave at the time of data collection were excluded.

Variables of the Study

Dependent variables

Knowledge of nurses` towards sam management protocol.

Independent variables

Gender, age, working experience, curriculum, qualification, unit of work.

Sample Size Determination and Sampling Technique

Sample size was computed based on single population proportion formula by taking the knowledge level of health professionals towards SAM management protocol (50%) at 95% Confidence level and 5% margin of Error. Where: Proportion of SAM (p)=50%:

$$n = \frac{Z_{\frac{\alpha}{2}}^2 P(1-p)}{d^2}$$

Z=Standard critical value,

Margin of error (d)=0.05,

n=384,

Total population of nurses in 3 months (N)=200.

As the sample size calculated is greater than 5% of the total population, finite population was used to calculate the effective final sample as follows:

$$nf = \frac{n0}{1+\frac{n0}{N}}$$

$$nf = \frac{384}{1+\frac{384}{200}}$$

Considering 10% non-response rate, total sample was 145. As the sample size and the final sample calculated is approximate, all Nurses who are present during the data collection period were included in the final study (n=132).

Data Collection Methods

The data collection instrument was pre-tested before the data collection. An anonymous self-administered questionnaire was adopted and modified after reviewing different literature mainly the components of national SAM management protocol in English language [5]. Trained data collectors were used to explain objective of the study, collect the filled questionnaire and give guidance for the participants.

Data Quality Management and Data Analysis

Pre-testing was conducted in Haramaya hospital prior to data collection process. Based on the pre-test, questions were revised and edited with necessary modification. Questionnaires were prepared in English since our study populations were educated and can read and understand the concept of the questions this was minimize the risk related with questioner translation. Data was analysed using SPSS version 20 software package. The data was cross checked prior to actual analysis. The data was presented using mean, Standard deviation, Percentage, graphs and tables. Additionally, one way analysis of variance was done to compare the mean knowledge score of the study subjects.

Ethical Considerations

Ethical clearance was obtained from Health Science College Ethical review committee before the staring of the field work. Respondents were informed about the objective and purpose of the study and verbal consent was obtained from each respondent. Moreover, all the study participants were informed that they have a full right to participate or decline from participating in the study and the study participants were assured for an attainment of confidentiality for the information obtained from them.

Operational Definitions

Good knowledge: When overall knowledge score of study participant's is above mean. All correct answers were coded as 1 while the incorrect one were coded as 0, then the sum and mean of the sum of observations was calculated to define the knowledge cut off point. Similarly, poor knowledge was defined as overall knowledge score below the mean knowledge score of the sample [9].

Results

Socio demographic characteristics

A total of 132 nurses were included in this study. Out of this 75 (57%) were females working in different units of the Hospital. Majority (42.4%) were in the age below 30 years. The mean age of the nurses were 32.2 years (32.2 years ± 5 years). Only few, 11 (8.3%) has less than one years working experience, while 63(47.7%) has 1-5 years working experience, 40 (30.3%) has 6-10 years working experience and about 13% have work experience above ten years **(Table 1).**

Among 132 study participants 39 (29.5%) were used WHO guideline to treat SAM, 27 (20.5%) were used UNICEF guidelines to treat SAM 39 (29.5%) were used Ethiopian SAM management protocols and 27(20.5%) did not used all. Majority of them 108 (81.8%) nurses covered childhood in malnutrition portion in their academic stay while more than half, 59(44.7%) covered in their second year of study. About 101 (76.5%) of nurses were ever involved in management of SAM. Also 117 (88.6%) of nurses perceive that time of devoted to childhood severe acute malnutrition section was adequate **(Table 2).**

Majority of the nurses 98 (74.2%) received training on Severe Acute Malnutrition, and interestingly SAM displays are displayed at the various work place on pediatrics, inpatient and outpatient wards or consultation room **(Table 2).**

Nurses knowledge on SAM management

About half of nurses, 49.2% correctly identified the MUAC cut off points for diagnosing SAM. Regarding antibiotics treatment recommendation for SAM children, 63 (47.7%) said that routine antibiotics should be given for all children. An estimated 50.8% and 47.7% correctly identified the boosted Vitamin A dosage foe less than six months (50, 000 IU) and above one year (200, 000 IU) respectively. Regarding correct discharge criteria in accordance with the national recommendations, half of nurses correctly identified has no edema and reached target weight correctly.

Table 1 Socio Demographic Characteristics Of Nurses In Hfsuh, Ethiopia, 2018.

Variables	Gender	Frequency	Percent (%)
Sex	Male	75	57
	Female	57	43
Age	19-28 years	56	42.4 %
	29-38 years	45	34.1%
	39-48 years	23	17.4%
	49-58 years	8	6.1%
Work Experience	19-28 years	56	42.4 %
	29-38 years	45	34.1%
	39-48 years	23	17.4%
	49-58 years	8	6.1%
	<1 year	10	8.1
	1-5 years	3	2.27
	6-10 years	6	4.54

Table 2 SAM management related behaviors of Nurses in HFSUH, Ethiopia, 2018.

Variables		Frequency	Percent (%)
Was childhood covered in curriculum	Yes	108	81.8
	No	24	18.2
If Yes, which study year of study covered	First year	26	19.7
	Second year	59	44.7
	Third Year	40	30.3
	Fourth Year	7	5.3
Nurses involved in management of severe acute malnutrition	Yes	101	76.5%
	No	31	23.5%
After being employed have you ever attended in-service or out-service training/s on SAM?	Yes	98	74.2
	No	34	25.8

More importantly on the type of electrolyte to be given for SAM with edema as potassium (53%). While 64.4% of nurse identified wasting as low weight for height tor length depending on age and 62.9% of nurses identified WFH/L percentage above 85% as discharge criteria for older children with SAM **(Table 3; Figure 1).**

Regarding nurses` knowledge on SAM management protocol, out of the 23 questions 65 (49.2%) had poor knowledge (scored below the mean) and 67 (50.8%) had good knowledge on malnutrition and its managements (had answered above the average questions correctly). Out of the total 100 points, the mean knowledge score of nurses was above the average, 53.9 with standard deviation of 14.4 points **(Figure 2).**

Majority of 65 (49.2%) were used all types of nutritional therapies are necessary for severe acute malnutrition children, 32 (24.2%) were used F-75 milk, 18 (13.6%) were used F-100 milk and 17 (12.9%) were used RUTF **(Figure 2).** About 50 (37.9%) were reported most of death related to malnutrition are caused by dehydration, Anemia and shock. While 43 (32.6%) dictated that majority of SAM related deaths are caused by hypocalcaemia, infection and dehydration. Similarly respondents stated that, 32 (24.2%) of respondents stated that electrolyte imbalance and hypoglycemia and hypothermia are predominant causes SAM related deaths. Regarding fluid therapy, 18 (13%) of nurses recommend fluid therapy by intravenous route for SAM children as opposed to oral route. With respect to diuretic therapy, all did not recommend antidiuretic therapy for SAM child with edema **(Table 3; Figure 3).**

In line with routine medication and supplements, majority of them, 61 (46.2%) said iron can be given at the beginning of Transition phase, 35 (26.5%) were given iron at stabilization phase while the rest occurred during discharge.

Practice towards SAM management

As shown in **Figure 4,** 100 (75.8%) of the nurses have ever worked in SAM management in the hospital or elsewhere. Regarding the types of guideline used 39% used WHO SAM guideline followed by 35 (26.5%) used Ethiopian national SAM guideline for management of SAM children **(Figure 4).**

Correlates of knowledge on SAM management

Being ever involved in SAM management, having recent SAM training and gender were the major factors associated with

Table 3 Shows Different aspects of nurses knowledge on SAM management protocol among Nurses in HFSUH, 2018.

Variables	Answered correctly N (%)
MUAC cut off to diagnose SAM above six month	65 (49.2%)
Routine Antibiotic recommendation ✓ For all SAM children	63 (47.7%)
vitamin A dosage booster for less than six months of ✓ 50,000 IU	67 (50.8%)
vitamin A dosage booster for 12-59 months of age ✓ 200,000 IU	63 (47.7%)
Necessary investigation Prior to discharge ✓ HIV	43 (32.6%)
Which one are the Discharge Criteria for SAM Children from 6month to adulthood? Has no oedema and reached target weight	66 (50%)
Correctly state discharge Criteria for Children <6 month or <3 kg being breast fed ✓ Weight gain on breast milk alone ✓ Has no medical problem	63 (47.7%)
Appropriate electrolyte for child having worsening oedema? Potassium	70 (53%)
How is wasting defined in the road to health booklet? Low weight for height	85 (64.4%)
Not used as discharge criteria for a child with SAM The height for age is on the 0-line target	43 (32.6%)
Which one is the Discharge Criteria for Children above 6month to 18years old? W/L or WFH >85%	83 (62.9%)

Table 4 Factors associated with knowledge level of Nurses on SAM management in Eastern Ethiopia.

Variables	Options	Knowledge level			
		Knowledgeable	Not knowledgeable	AOR	P value
Gender	Female	35	40	1	
	Male	32	25	1.27 (0.62- 2.60)	0.520
Ever involved in SAM management	Yes	53	50	1.70 (0.72- 4.04)	0.228
	No	14	15	1	
SAM training	Yes	53	43	1.56 (0.67- 3.61)	0.301
	No	14	22	1	

knowledge level of nurses (p>0.05). Males were 1.27 (95% CI: 0.62-2.60) times more odds of being knowledgeable as compared to females. Nurses with the previous experience of managing malnourished child had 1.70 (95% CI:0.72-4.04) times more likely to be knowledgeable as compared to their counterparts. Having SAM training was associated with having higher knowledge score (AOR=1.56; 95% CI:0.67-3.61) **(Table 4).**

Having SAM training was found to have significantly higher knowledge score than without training (p=0.034). While those

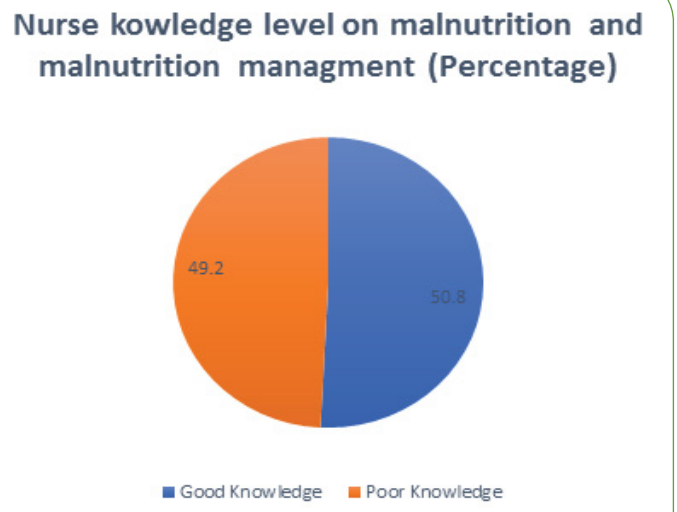

Figure 1 Level of Nurses knowledge on SAM management among Nurses in HFSUH, Harar Ethiopia.

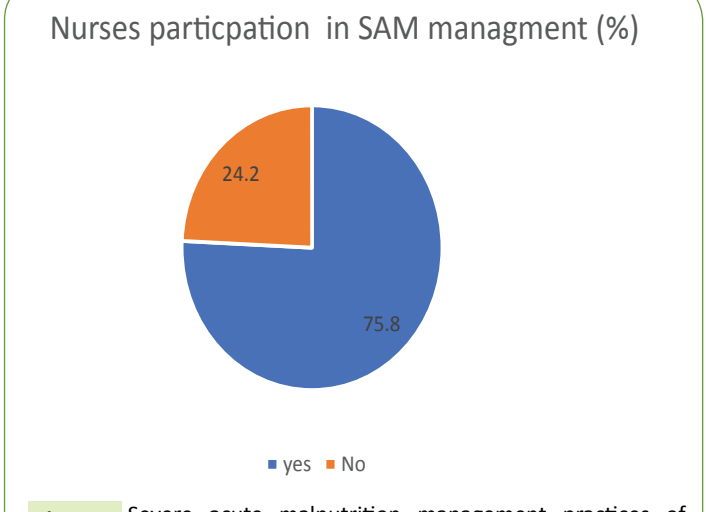

Figure 4 Severe acute malnutrition management practices of Nurses in HFSUH, Harar, Ethiopia.

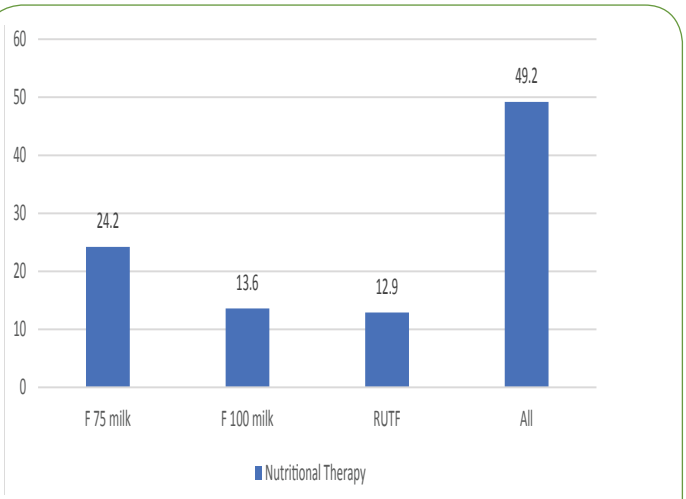

Figure 2 Perceived type of nutritional therapy given for children among Nurses in HFSUH, Harar, Ethiopia, 2018.

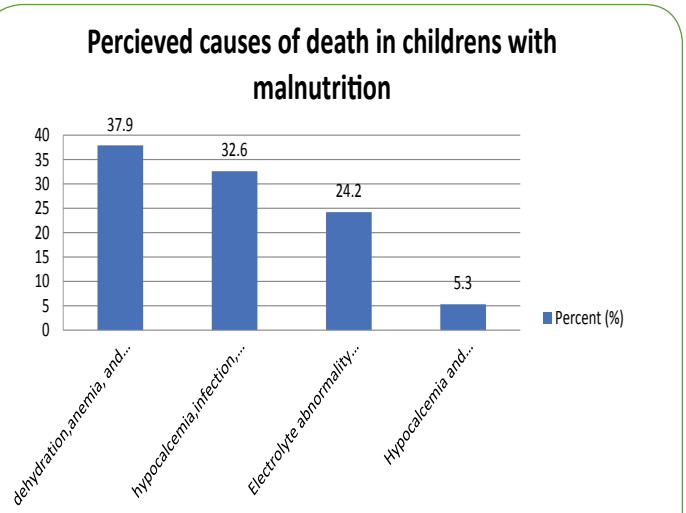

Figure 3 Perceived causes of death in children with severe acute malnutrition in Hiwot Fana Specialized University Hospital in Harar town eastern Ethiopia 2018 GC.

with previous experience of managing SAM children had higher knowledge score than the counters (p=0.034).

Discussion

This particular study assessed the knowledge and its correlates among nurses in Hospital, Eastern Ethiopia. The finding of the study showed that out of the 23 questions assessing knowledge, 65 (49.2%) had poor knowledge on malnutrition and its management. Males nurses (AOR=1.27 (95% CI: 0.62-2.60)), those with previous experience on managing malnourished child (AOR=1.70 (95% CI:0.72-4.04)) and having SAM training (AOR=1.56; 95% CI:0.67- 3.61) was associated with having higher knowledge score.

The knowledge level of nurses was not adequate. Similar study also showed the level of nurses knowledge was not universal, which showed greater level of knowledge among nurses of 74% [10]. On the other hand, the study [11] did not report an overall knowledge score but did conclude that nurses had poor knowledge about management of malnutrition in children. In addition, about 54% [12] of nurses were knowledgeable regarding malnutrition and its management. Similarly study conducted among nurses showed lower less than average knowledge score (mean=49 points with SD of 10) [13].

According to the WHO (2013) insufficient knowledge amongst nurses can lead to an incorrect diagnosis being made which could lead to poor clinical outcomes in the patient [1]. Similarly same study conducted among health care workers reported that the overall knowledge level of nurses was poor. And also they lack basic skills in assessing and managing SAM appropriately [14].

As this study showed having training on the SAM and its management is significantly increase the cognitive aspects of Nurses (knowledge). And on the other side the knowledge base understanding of nurses were poor [11,14] indicates the need for evidence based interventions to address high hospital mortality among SAM children. It is also evident that reductive adaptation that occurs in SAM children makes more vulnerable

to complications related to maltreatment. Especially excessive fluid therapy, treatment related to dehydration and electrolyte disturbance make them susceptible to develop complication and early treatment related deaths [1,5].

With the implementation of SAM management protocol, substantial reduction in mortality from 55% to below 20% is observed, but still the case fatality rate is unacceptably high [2]. In country like Ethiopia also 6% to 29% mortality has been observed among admitted SAM children is reported [15,16]. It is also evident that misdiagnosis ad mistreatment by health care professional due to lack of knowledge and skill contribute to large case fatality rate [17].

This emphasize for the need for health professional involved in management of SAM should strictly adhere them to the updated national SAM management protocol with aim to have optimal treatment outcome [18]. So regular training of nurses on nutritional screening and SAM management protocol with subsequent refreshment training is of valuable importance in order to early detect and appropriately treat SAM children. In support of the need for training study on health professionals, their knowledge on SAM screening and management was less than 30% [14]. Additionally, having previous experience in screening malnourished children scored higher knowledge score than counter parts [13]. Which is similar with our finding emphasizing the need for experience in order to develop skills and psychomotor development among nurses for better care of SAM children than perception.

Similar study also showed that having refreshment training increase the knowledge level of nurses [12]. Even if it is not significant, nutrition course coverage should strictly address the major public health concerns in colleges and universities like malnutrition, SAM management protocol and nutritional assessments. This will help nurses to help build their capacity in malnutrition and its management. Additionally, lack of continuity in training and refreshment training had significant contribution on management of SAM among health care providers in Africa [17].

Similar findings also showed important knowledge gaps were also noted regarding areas that focused on the clinical nutritional management of severely malnourished children. About 15% of the nurses knew that high-protein diets should not be prescribed for children presenting with kwashiorkor. Also, about 70% of them did not know that standard ORS should not be used to treat or prevent dehydration in SAM children [19]. This might be attributed to low access to regular training and refreshment workshops on malnutrition among nurses.

This can be regarded as basic information and a score of 100% would have been expected. But knowing the critical aspects of fluid therapy, nutritional supplement, micronutrient supplement and other had great impact on treatment outcome (Mortality). This is of critical importance to reduce mortality risk, relapse and increasing recovery [5]. This is important to achieve the global target to reduce acute malnutrition below 5% [20].

Conclusions

Generally, the knowledge level of nurses towards SAM management is not satisfactory. Those who ever involved in SAM management, having recent malnutrition training and gender were predictors of high knowledge score. This knowledge aspect is critical to achieve high recovery, reduced mortality and reduced relapse of malnutrition.

Recommendations

In general, there should be regular capacity building schemes for nurses especially for those who are involved in management of SAM at emergency or SAM unit. So HFSUH in collaboration with other stakeholders should plan, facilitate and organize in service training for nurses focusing on nutritional assessment, malnutrition and malnutrition management. In addition, malnutrition charts and other facilities should be in place that nurses can access.

Acknowledgments

Thanks for the study subjects for their involvement in this study.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from college of Health science ethical review committee. Verbal consent was obtained from study participants.

Consent for Publication

Not applicable.

Availability of Data and Material

All data generated or analysed during this study are included in this published article and its supplementary information files.

Competing Interests

The authors declare that they have no competing interests.

Funding

Funder has no role in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript.

Authors' Contributions

AO involve in design, write up, review, edit, data collection, data analysis and manuscript preparation. AH: participated in editing and reviewing the manuscript.

Acknowledgements

Many thanks to study participants for their time and valuable information.

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