KNOWLEDGE OF HEALTH CARE WORKERS TOWARDS THE MANAGEMENT OF SEVERE ACUTE MALNUTRITION IN INFANTS UNDER SIX MONTHS IN ADJUMANI HOSPITAL UGANDA. A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background
In Adjuman Hospital, there is limited knowledge among health workers understanding the nutritional treatment of SAM. This study aimed to determine the level of Knowledge of Health workers on the management of SAM among infants under 6 months of age at Adjumani Hospital.

Methodology
This was a cross-sectional study among 45 health workers at the hospital. Data was collected on participant demographics and knowledge factors using the Questionnaire and Key informant guide for qualitative data. Data was coded and entered into SPSS V 20 and analyzed. Qualitative data was transcribed as text, analyzed thematically, and presented according to major emerging themes.

Results
Most respondents were female (62.2%), 55.6% of the participants were aged (30-38) and 44.4% were diploma holders. (86.7%) of the respondents stated that they were trained in the management of SAM, (97.8%) of the participants had high Awareness about standard written guidelines to follow in the management of children with SAM, 40 % of the participants stated that their Source of information about SAM, if not trained, was through self-study and 80% of the participants mentioned correct answers that Children with SAM need to be kept dry and warm during the day and night to prevent hypothermia.

Conclusion
There is a high level of clinical knowledge on the management of SAM among health workers at Adjumani Hospital as evidenced by both quantitative and qualitative evidence even though most of the respondents interviewed were lower categories of health workers.

Recommendations
There is a need to intensify continuous medical education among staff. Knowledge of good nutrition is expected to result in better clinical practices.

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BACKGROUND

Globally, children younger than 5 years old are at risk for developing severe acute malnutrition (SAM). SAM is defined as very low weight-for-height (- 3SD) with evident severe wasting or nutrition oedema and an upper arm circumference of less than 115 mm. This risk is significantly higher in Sub-Saharan Africa (UNICEF/WHO/The World Bank Group, 2021). In addition, 25% of children with SAM worldwide are from Sub-Saharan Africa (de Onis *et al.*, 2012; UNICEF/WHO/The World Bank Group, 2021). Locally, the situation remains dire. 29% of Ugandan children are stunted, 4% are wasted, and 11% are underweight, according to the 2016 Uganda Demographic and Health Survey (UDHS) (UBOS, 2016). Current research indicates that 3.5% of Ugandan children under the age of

five are still wasted (UNICEF/WHO/The World Bank Group, 2021).

These complications can be mitigated, and mortality rates can be significantly lowered if guideline-based management protocols are followed (Arafat *et al.*, 2018). Notwithstanding, the case fatality rates of severe acute malnutrition in hospitals across Africa (SAM) have remained consistently high. In Uganda, the mortality rate is 25% (Nalwanga *et al.*,2020), an unacceptably high figure. This is happening despite the existence of the WHO and country-specific treatment guidelines. It is therefore plausible that among other factors, a paucity of adequate knowledge concerning the proper management of SAM by healthcare workers is responsible for such a burden (Fahim *et al.*, 2022).

Indeed, evidence from the literature on treatment procedures revealed that many health services employed discredited practices, and staff were unfamiliar with effective modern standards for the management of acute malnutrition (Nyeko *et al.*, 2016). Moreover, healthcare workers are instrumental in managing SAM, especially among infants below six months evidence regarding the classification and medical management of SAM is still limited (Kerac*et al.*, 2015). Consequently, when health workers in a resource-limited country, such as Uganda, display critical deficiencies in the knowledge and best practices concerning the management of diseases of public health relevance like SAM, the resulting consequences can be very grave. Many studies have emphasized the importance of healthcare workers knowing the management of severe acute malnutrition. As a result, this study was conducted to identify existing knowledge of Health workers on the management of SAM among infants under 6 months of age at Adjumani Hospital.

METHODOLOGY

Research Design

The study approach was both qualitative and quantitative. It adopted a descriptive cross-sectional design. This method was chosen because it helped the researcher to collect accurate data from different study participants on their knowledge of the management of severe acute malnutrition in infants below six months at Adjumani Hospital at one point in time.

Study Population

The study population was comprised of all healthcare workers(doctors, clinical officers, and nurses) who have worked at the pediatric department of Adjumani Hospital for a minimum of three months. These health cadres carry out

the clinical management of patients with severe acute malnutrition when they present to the hospital. We also chose to administer our research tools to cadres that have been in the pediatric unit for at least three months because this time frame is required for one to have sufficient knowledge and best practices on how the department manages children below six months with severe acute malnutrition and was able to provide the required information to the researcher.

Sample size calculation

The sample size for the study was determined using the Morgan and Krejcie table of 1970. Currently, the available number of healthcare workers at Adjumani Hospital's pediatrics department is 50 people, as such our N = 50. From the Morgan and Krejcie table, the corresponding S value to an N of 50 is 44.

Qualitative investigation

A total of 15 health workers who had not participated in the questionnaire interview session were purposively selected from 05 departments of the hospital and interviewed until maximum saturation.

Sampling technique

A simple random sampling method was used to select participants in this study. This method has been chosen because all participants have an equal chance of being included in the study preventing subjectivity and bias. Besides, results can be generalized to the target population (Brink, Van Der Walt, and Van Rensburg, 2018). This method was implemented with the fishbowl technique. All healthcare workers eligible to participate in the study were assigned numbers. The assigned numbers were written on small pieces of paper, folded, and then put in a container. A piece of paper was drawn from the container at a time and the name of the participant was noted. The paper was then placed back and the container was re-shaken. The same procedure was repeated until the desired sample size was reached.

Data Collection Methods

Questionnaire Survey

Data collection was conducted by structured questionnaires containing closed and open-ended questions. The questionnaire with both open-ended and close-ended questions is a great tool to explore both qualitative and quantitative data (Karjono, 2020). Moreover, the structured questionnaire ensured that we remained systematic and

ensure that all participants were asked similar questions (Polit, 2017). This questionnaire explored the demographic characteristics of the healthcare workers; and their knowledge concerning the management of severe acute malnutrition especially among infants below six months. All study participants were subjected to the questionnaire.

Data Collection Instrument

The researchers employed a structured directly administered questionnaire that included both open-ended and closed-ended questions.

Quality Control

Validity

Is the extent to which the scores from a measure represent the variable they are intended to (Creswell,2018) . To ensure content validity, the researcher conducted an extensive literature review to ensure that all the components of the research questions under study were included in the questionnaire. Most items of the questionnaire were formulated based on the WHO malnutrition management guidelines. The questionnaire has also been presented to a medical doctor working in the Mwana Mugimu nutritional unit at Mulago Hospital and to an experienced faculty member in the faculty of agricultural sciences at Uganda Christian University to enhance its validity. Their responsibility was to evaluate what the instrument was measuring, what had been missed, and if it was an appropriate tool for the study.

Reliability

Reliability is a measure of how consistently a test measures a desired characteristic (Karjono, 2020). As such, the Participants were asked to make any comments on the tool. The feedback from the pretesting was to aid the researchers in making necessary additions, subtractions, and/or modifications to the questions to improve their clarity.

Data Collection Procedure

Data collection was done at Adjumani Hospital after getting permission from the hospital director and the head of the pediatrics department. We asked for permission from the ward in charge, to ascertain the best time to collect data from our study participants. To ensure privacy, we sought further permission to conduct the administration of the study questionnaires in a private room. Additionally, we administered all the questionnaires in person. We then approached the sampled study participants and explained the purpose, objectives, and benefits of our study. If the participants were willing to participate in our study, they consented and the interviews were conducted immediately or at their convenient time. The researcher personally rechecked all answered questionnaires for completion of daily data accuracy and to ensure quality data. The data was then entered into EpiData software for data clean-up. During data collection, the questionnaires were assigned numbers based on the number of participants to detect any missing questionnaires and in readiness for data entry.

Data Analysis

Analysis of Quantitative Data

Data was analyzed using SPSS 20; Frequencies, charts, and percentages were used to present demographic data. Descriptive statistics (means, standard deviations, percentages, and frequencies) were used to describe and summarize the participant's knowledge, practices, and attitudes regarding SAM. Cross tabulations were used to determine the impact of participant-dependent factors on knowledge of the management of children with SAM. We also conduct correlation tests to analyze the relationship between participants' knowledge, practices well, and attitudes toward SAM.

Analysis of Qualitative Data

Open-ended questions were analyzed through thematic categorization. Briefly, organized all the available data for analysis into a coding system. To achieve this, we shall read all the available data, highlight important quotations, and make interpretations into major themes. We also developed an appropriate coding system. We then classified all the major themes under the developed coding system. We then interpreted our coded themes.

Ethical Considerations

The study was sought for ethics approval from the Uganda Christian University School of Medicine Research and Ethics Committee (SOM-REC). The research was conducted per good clinical practice, the Declaration of Helsinki, and the Ugandan laws and regulations. The participants were free to ask any questions before consenting to take part in the study. No medical procedures were performed on the study participants. Therefore, there were no risks to their health. Participants were free to opt-out if they felt like they did not want to continue with the interview. The participants' names were not written on the questionnaire to maintain anonymity. Additionally, the written consent form was kept separate from the questionnaire such that it cannot be used to identify the respondents. The completed questionnaires and all documents with participant information were stored in

sealed envelopes and placed under lock and key. During analysis, study data was kept using password-protected computers that only I and my supervisors have access to.

RESULTS

Table 1: Demographic characteristics of respondents

Participant characteristics	Frequency	Percentage
Gender		
Female	28	62.2
Male	17	37.8
Age (Mean =33.7, Median= 34, SD=5.3, Range =25-45)		
20-29	12	26.7
30-38	25	55.6
≥40	8	17.8
Level of Education		
Certificate	11	24.4
Degree	9	20.0
Diploma	20	44.4
Masters	5	11.1
Cadre		
Clinical officer	6	23.3
Doctor	7	15.6
Enrolled Nurse	6	13.3
Midwife	8	17.8
Nursing officer	9	20.0
Registered Nurse	9	20.0
The period spent in service in years		
1-4	12	26.7
5-8	26	57.8
≥ 9	7	15.6
Department of work		
Maternity	8	17.8
Medical	7	15.6
Nutrition	5	11.1
OPD	14	31.1
Pediatric	9	20.0
Surgical	2	4.4
Period of work in NRU department (Mean =6.0, Median= 6,SD=2.5, Range =1-12) (Months)		
13-24	18	40.0
25-36	9	20.0
3-12	8	17.8
37-48	6	13.3
>48	4	8.9
Last period of in-service training/Education		
13-24	15	33.3
25-36	11	24.4
37-48	6	13.3
<12	11	24.4
>48	2	4.4

Table 1 shows that most of the respondents were female (62.2%), a n d most healthworkers were aged 30-38 with a mean of 33.7 and a median of 34 years.

Table 2: Knowledge of healthcare workers on management of SAM

Participant characteristics	Frequency	Percentage
Awareness of standard written guidelines to follow in the management of children with SAM		
No	1	2.2
Yes	44	97.8
Trained in the management of SAM.		
No	6	13.3
Yes	39	86.7
Last time of the training.		
<12	26	57.8
13-24	10	22.2
25-36	4	8.9
37-48	5	11.1
Source of information about SAM if not trained.		
Colleagues	1	10.0
Pre-service	3	30.0
Self- study	4	40.0
Self-study	1	10.0
Ward in charge	1	10.0
SAM children with no signs of infection do not requirebroad-spectrum antibiotics.		
Correct answer	44	97.8
Incorrect answer	1	2.2
Children with SAM need to be kept dry and warm duringthe day and night to prevent hypothermia.		
Correct answer	36	80.0
Incorrect answer	9	20.0
IV should only be given to SAM children in shock.		
Correct answer	23	51.1
Incorrect answer	22	48.9
F75 is given in the rehabilitation phase of SAM.		
Correct answer	33	73.3
Incorrect answer	12	26.7
SAM children with diarrhea and vomiting should be givenORS.		
Correct answer	43	95.6
Incorrect answer	2	4.4
Feeding of SAM children should be done every 3 hoursduring the day and night to prevent hypoglycemia.		
Correct answer	31	68.9
Incorrect answer	14	31.1
A nasogastric tube should be used in SAM children who feedless than 75% of the prescribed diet.		
Correct answer	18	40.0
Incorrect answer	27	60.0
Poor skin turgor is not a reliable method for diagnosingdehydration in SAM children.		
Correct answer	24	53.3
Incorrect answer	21	46.7

Table 2 shows high Awareness among participants of standard written guidelines to follow in the management of children with SAM (97.8%) with the majority of participants (86.7%) having been trained in the management of SAM.

DISCUSSION

This study found high awareness of guidelines to follow in the management of children with SAM (97.8%) among participants. This indicates the management effort that the hospital has put in place to make these guidelines and the effort of health workers to know the guidelines. Knowledge of SAM guidelines are important for making good clinical decisions and influences practice (Chapman, et al 2015). The majority of participants (86.7%) had been trained in the management of SAM and most of them reported their last training was <12 months ago. Training of staff improves both their skills and knowledge (Nyeko et al.,2016) (Kerac et al., 2015). Perhaps this explains the high number of staff aware of guidelines for SAM at Adjumani Hospital and the hospital management's commitment to staff development. Qualitative findings in themes 1, theme 2, and 3 from the current study also found good skills and knowledge on detection management and prevention of SAM among health workers Exploration of prevention of severely malnourished children from developing hypoglycemia, it was evident that the use of glucose and feeding practices were known by health workers as methods that reduce the risk of hypoglycemia among malnourished children. Most of the Health workers who participated in the study emphasized the best way to prevent hypoglycemia is through breastfeeding Indication is evidence of substantial knowledge on the prevention of hypoglycemia among malnourished children.

"What comes to my mind whenever I see a mother with a malnourished child is to tell her to breastfeed the child many times to prevent low glucose levels. Even if this can be given through IV bolus there is a saying that prevention is better than cure". (HW, Female Ward)

… "I think the best way to keep children warm in our setting is to provide a wrapping like a blanket that can give warmth. I have had other methods used in developed countries such as machines but here we cannot afford them. I keep telling mothers to keep their children in warm clothing" (HW Paed ward)

On the other hand, a section of respondents affirmed that they had not had in-service training in the near past. Most participants who mentioned they had not had in-service training on SAM said they had had self-study and pre-service training as their source of information on SAM. Lack of service training programs for health workers has been long associated with a lack of knowledge and subsequent effect on service delivery Puoane et al., 2008. Previous studies by (Bachou, 2008; Mowe et al., 2008; Nzioki et al.,

2009; and Warfa et al., 2014) have reported a lack of sufficient knowledge in health concerning the management of infants with SAM which influences their practice. Other studies have also reported similar findings among caregivers in India (Gaur and Bansal, 2016). Another study in Ethiopia also established that 45 percent of health workers in Ethiopia had insufficient knowledge of SAM management (Tafese and Shele, 2015). Overall general knowledge detection and management of SAM was high Majority of health workers (97.8%) were aware that SAM children with no signs of infection do not require broad-spectrum antibiotics, Children with SAM need to be kept dry and warm during the day and night to prevent hypothermia (80.0%) and that Intravenous fluids should only be given to SAM children in shock. In qualitative investigations, it was evident that, concerning Antibiotics during the treatment of malnourished children, most health workers were not certain of which antibiotics to give to children especially those who work in non-admitting departments. The current study is consistent with studies that established awareness of the availability of guidelines on SAM but with limited compliance (Moges and Haidari,2009; Nzioki et al.,2009; Benyera and Hyera,2013)

"...I don't think these children are very special from others when it comes to drugs, I think we need to give them broad-spectrum antibiotics because one child may come with say a cough and bad skin. We need a drug like ceftriaxone that can treat both complications"

In terms of managing dehydration and feeding practices of children with SAM, the knowledge of health workers was equally high as in other areas of assessment for the current study. Most health workers mentioned sunken eyes, and poor skin tag as signs of severe dehydration. One participant mentioned that the child may pass out very little urine. This shows a high awareness of dehydration and its signs among health workers. One male health worker from OPD mentioned

…" It is easy to know a child who has severe dehydration. The first thing I look at is skin tag which is always bad and the eyes to see if they are sunken." (HW OPD).

Most health workers (73.3%) were aware that F75 is given in the rehabilitation phase of SAM and that children with SAM and diarrhea and vomiting should be given ORS as a way to replace lost fluids and minerals. On the other hand, most health workers (68.9%) were aware that Feeding SAM children should be done every 3 hours during the day and night to prevent hypoglycemia**.** Less than half of respondents (40.0%)were aware that Nasogastric tube

should be used in SAM children who feed less than 75% of the prescribed diet. This finding of suboptimal knowledge level is consistent with other previous studies elsewhere (Warfa*et al.*, 2014) and (Tafese and Shele, 2015).On the use of skin tags to diagnose dehydration in SAM, more than half of the respondents (53.3%) agreed that Poor skin turgor is not a reliable method for diagnosing dehydration in SAM children consistent with (Nzioki *et al.*,2009).

CONCLUSION

There is high clinical knowledge on the management of SAM among health workers at Adjumani Hospital as evidenced by both quantitative and qualitative evidence even though most of the respondents interviewed were lower categories of health workers.
Awareness about malnutrition and SAM was found to be high among health workers in Adjumani Hospital. Most health workers reported they had formal in-service training on SAM. There is still a section of health workers who have never had in-service training on SAM which needs to be addressed through low-cost interventions like CMEs.

RECOMMENDATION

Due to a section of health workers with specific knowledge gaps in some and among those who had not benefited from in-service training, there is a need to intensify continuous medical education among staff. Knowledge of good nutrition is expected to result in better clinical practices.

ACKNOWLEDGMENT

LIST OF ABBREVIATIONS

SAM: Sever Acute Malnutrition.
CME: Continuous Medical Education.
SOM-REC: School of Medicine Research and Ethics Committee.
WHO: World Health Organization
UNICEF: UnitedNations Children Fund.
UDHS: Uganda Demographic and Health Survey.
UBOS: Uganda Bauru of Statistics.
OPD: OutpatientDepartment.

SOURCE OF FUNDING

CONFLICT OF INTEREST

AUTHORS BIOGRAPHY

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