ORIGINAL ARTICLE

Maternal knowledge, attitude and practices related to diarrhea in children aged less than five years in Kabarole district, Uganda.

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Abstract

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Diarrhea remains the leading cause of child mortality around the globe, being responsible for about 9.0% of all child deaths. Uganda remains among the 15 countries that account for almost three quarters of all deaths from diarrhea among under-five children. The disease is on the increase in Kabarole district. Data and information about maternal knowledge, attitude and practices on it remains scarce as no studies have previously been done. The objective of the study was to assess maternal knowledge, attitude and practices in relation to diarrhea among children under five years old in Kabarole district in Uganda.

A Community-based cross sectional study was carried out in Kabarole district in Uganda from December 2015 – January 2016. A sample of 367 subjects was randomly selected from from Rwimi Sub County and East Division. Data were collected using a structured questionnaire. Logistic regression was used to examine the associations between study factors and diarrhea occurrence.

Findings revealed that mean ages of mothers/care takers and under-five children were 28.9 years and 26.5 months respectively. Among mother/caretakers, 79.9% had formal education, and 61.4% had a household monthly income < UGX90, 000. Prevalence of diarrhea morbidity over a seven days period preceding the study was 33.2% while that over a 14 days period preceding the study was 48.6%. After adjusting for all possible confounder factors, it was found out that children aged ≥ 6 months (Adj. OR = 8.32, 95%CI = 2.42 – 28.54), children aged of 7 – 11 months (Adj.OR = 8.97, 95%CI = 3.25 – 24.75), poor level of practices by caretakers (Adj. OR = 29.67, 95%CI = 10.40 – 84.62) and moderate level of practices by caretakers (Adj. OR = 3.27, 95%CI = 1.16 – 9.17) were associated with diarrhea occurrence among under-five children.

Diarrhea prevalence among under-five children was high in Kabarole district. This study therefore recommends for appropriate behavioral change interventions to be developed and implemented for reducing diarrhea in children.

Keywords: attitude, knowledge, practice, diarrhea, under-five children

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ปีที่ 14 ฉบับที่ 2 พฤษภาคม-สิงหาคม 2559

ความรู้ ทัศนคติ และการปฏิบัติที่สัมพันธ์ต่อการเกิดโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 5 ปี ที่อำเภอคาบาโรเล ประเทศยูกานดา

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บทคัดย่อ

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ความรู้ ทัศนคติ และการปฏิบัติที่สัมพันธ์ต่อการเกิดโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 5 ปี ที่อำเภอคาบาโรเล ประเทศยูกานดา ว สาธารณสุขและการพัฒนา. 2559;14(2):33-48

โรคอุจจาระร่วงยังเป็นสาเหตุสำคัญของการป่วยในเด็กทั่วโลกและเป็นสาเหตุการเสียชีวิตในเด็ก (ร้อยละ 9) ส่วนประทศอูกานดาเป็นหนึ่งใน 15 ประเทศที่โรคอุจจาระร่วงเป็นสาเหตุการเสียชีวิตของเด็กอายุต่ำกว่า 5 ปี 3 ใน 4 ของการตายเกิดจากโรคอุจจาระร่วง ในอำเภอคาบาลโรเล ประเทศยูกานดา ก็มีจำนวนผู้ป่วยโรคอุจจาระร่วงเพิ่มขึ้น แต่ข้อมูลเกี่ยวกับระดับความรู้ ทัศนคติและการปฏิบัติตัวของผู้ดูแลเด็กยังไม่มีการศึกษามาก่อน ดังนั้นการศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างระดับความรู้ ทัศคติ และการปฏิบัติตัวของผู้ดูแลเด็กกับการเกิดอุจจาระร่วงในเด็กอายุต่ำกว่า 5 ปี

การศึกษาภาคตัดขวางได้ดำเนินการที่อำเภอคาบาโรเล ตั้งแต่เดือนธันวาคม 2558 ถึง เดือนมกราคม 2559 โดยเก็บข้อมูลจากการสุ่มจากตำบลรูวิมี และอิสดิวิชั่น จำนวน 367 ราย โดยใช้แบบสอบถามที่ผ่านการพัฒนาคุณภาพในการเก็บข้อมูล และดำเนินการวิเคราะห์โดยการถดถอยโลจิสติก ในการหาความสัมพันธ์ระหว่างตัวแปรอิสระและการเกิดโรคอุจจาระร่วง

ผลการศึกษาพบว่าอายุเฉลี่ยของผู้ดูแลเด็กคือ 28.9 ปี ส่วนเด็กมีอายุเฉลี่ย 26.5 เดือน ในกลุ่มผู้ดูแลเด็ก ร้อยละ 79.9 ได้รับการศึกษา ร้อยละ 61.4 มีระดับรายได้ต่ำกว่า 90,000 UGX ความชุกของการเกิดโรคอุจจาระช่วง 7 วันก่อนการศึกษานี้ เท่ากับ ร้อยละ 33.2 และความชุกช่วง 14 วันก่อนการศึกษา เท่ากับ ร้อยละ 48.6 หลังจากควบคุมอิทธิพลปัจจัยกวนแล้วพบว่า เด็กที่มีอายุเท่ากับหรือต่ำกว่า 6 เดือน (Adj. OR = 8.32, 95%CI = 2.42 – 28.54) และเด็กอายุ 7-11 เดือน (Adj. OR = 8.97, 95%CI = 3.25 – 24.75)ผู้ดูแลที่มีระดับการปฏิบัติตัวป้องกันอุจจาร่วงต่ำ (Adj. OR = 29.67, 95%CI = 10.40-84.62) และผู้ดูแลที่มีระดับการปฏิบัติตัวป้องกันอุจจาร่วงปานกลาง (Adj. OR = 3.27, 95%CI = 1.16-9.17) สัมพันธ์ต่อการเกิดโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 5 ปี

อัตราการเกิดโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 5 ปี ในอำเภอคาบาโรเล ยังอยู่ในอัตราที่สูง ดังนั้นการพัฒนาและดำเนินการโครงการปรับเปลี่ยนพฤติกรรมเพื่อป้องกันการเกิดโรคอุจจาระร่วงในเด็กจึงมีความจำเป็น

Keywords: ทัศนคติ ความรู้ การปฏิบัติ อุจจาระร่วง เด็กต่ำกว่า 5 ปี

Introduction

Diarrhea remains among the leading causes of child mortality around the globe[1-3]. It is estimated to be responsible for about nine per cent of all child deaths1. It is imperative to note that most deaths (90.0%), due to diarrhea occur in South Asia and Sub-Saharan Africa[4]. Uganda remains among the 15 countries that account for almost three quarters of all deaths from diarrhea among children under five years old[4], where a single child is known to experience an average of 3.2 episodes per year[5]. This leads to nutritional deficits and long-term consequences[4, 6] such as impaired cognitive function and stunted growth[4].

The burden of diarrhea is disproportionately high among children in low-and middle-income countries[7-9]. It is imperative to note that most deaths (90.0%), due to diarrhea occur in South Asia and Sub-Saharan Africa[7]. Just 15 countries account for almost three quarters of all deaths from diarrhea among children under five years old, and all these countries are in Africa and South Asia and these include Afghanistan, Angola, Burkina Faso, China, Democratic Republic of the Congo, Ethiopia, India, Indonesia, Kenya, Mali, Niger, Nigeria, Pakistan, Tanzania, and Uganda. The highest numbers of childhood deaths were in Sub-Saharan Africa, where 50.00% of deaths from diarrhea occurred in 2011[7], a clear indication that the most severe of outcomes of diarrhea are concentrated in the highest burdened countries.

Uganda is the ninth in the whole world among countries with the highest mortality rate due to diarrhea with approximately 29,300 child deaths occurring every year due to the disease[10]. This has transformed into severe economic repercussion in terms of treatment.

In Kabarole district, the selected area for this study, diarrhea remains among the top 10 causes of morbidity within the district, accounting for 15,179 cases in the financial year 2013[11]. According to the data from the Health Information Management System, diarrhea cases within the district were on an increase, with the district having registered 12,335 and 14,606 cases of diarrhea in 2011 and 2012 respectively[11].

Diarrhea is on an increase in Kabarole district, yet data and information about maternal knowledge, attitude and practices remains scarce as no studies have previously been done to establish this, thus inadequate and/or misguided response towards this health problem. The situation is compounded by the scares resources available at the district local government. With the eradication of graduated tax in 2001, most local governments have remained with scarce resources since the financial releases from the national consolidated funds to the districts are inadequate and untimely. Such an increase in the magnitude of diarrhea among children under the age of five in Kabarole district has forced the district to spend these few resources that would otherwise have been directed towards development works to treatment of diarrhea in children. The productivity levels of the people within the district are also lowered as parents and care takers spent productive time taking care of sick children. The future productivity of the children was adversely affected as a result of the severe outcomes of diarrhea which affected their disability adjusted life years.

It is a known fact that caretakers play a key role in managing childhood illness[12,13]. The perception and attitude of caretakers about the severity of diarrheal

illness ultimately determines the level of preventive efforts and subsequent rate of seeking for treatment in case the child develops diarrhea[14]. It is therefore of paramount importance that the knowledge, attitude and practices of child mother/caretakers is ascertained and adequate attention for improvement put in place to reduce the high level of diarrhea prevalence among children less than five years old.

This study therefore aimed at assessing maternal knowledge, attitude and practices on childhood diarrhea and determining the risk factors for diarrhea occurrence among under-fives in order to guide and influence health policy formulation and implementation to improve the situation.

Methods

Study design

A community based cross-sectional study design was used to establish maternal knowledge, attitude and practices (KAP) in relation to diarrhea in children less than five years old in Kabarole district. According to the World Health Organization (WHO), diarrhea is defined as the passage of three or more loose or liquid stools per day or more frequent passage than is normal for the individual[10]. A diarrhea case in this study was defined as a child passing out loose stools three to four times a day, had abdominal pain and stools containing blood or mucus during the above mentioned periods[10].

Study area

The study was conducted in Kabarole district which was located in mid-western Uganda, 320 km far away from the capital Kampala city. The district lies at an altitude of 1,300 – 3,800 meters above sea level. The district borders with Bundibugyo in the west, Kasese in the south, Kamwengye in the south east and Kyenjojo in the east. It is composed of three Counties, 18 Sub Counties, six town councils, three divisions, 85 parishes and 750 villages[15]. The study covered two Sub Counties of Rwimi and one East Division.

Study population

The study population involved all mother/caretakers of children under five years old in Kabarole district.

Sample size estimation

The sample for this study was determined using the Leslie Kish formula of 1965[16]. A confidence interval of 95%, an acceptable error of 5% and a proportion of children having diarrhea of 32.0%[17] were used to estimate the sample size.

From the calculation 334 respondents was needed, adding 10.0% for any errors that could occur, the total 367 was required to use in this study.

Sampling techniques

Under the decentralization policy of Uganda[18], lower local administrative units were established. Below the district is the Sub County, followed by the parish and then the village is the lowest administrative unit[18]. Therefore, after selection of the district as Kabarole district by convenience, selection of two sub counties of Rwimi and East division was done by simple random sampling. Rwimi Sub County had three parishes with approximately equal number of households[19]. These were: Kakooga, Kadindimo, and Kaina parishes[19]. East division on the other hand had

four parishes of Kitumba, Bukwali, Nyakagongo and Njara[19]. Using the simple random sampling technique Kakooga parish was selected in Rwimi Sub County while Kitumba parish was selected in East division.

The chairpersons (village headmen) of all the villages in the selected parishes were contacted and asked to provide the names of all households within their villages that had under-five children. The names of households provided were then assigned numbers and the households that were interviewed were selected randomly using the simple random sampling technique. To determine diarrhea prevalence in under-fives, a simple random sampling technique was used to select one study subject in households with more than one under five children. This meant that one household was represented by one child.

Inclusion criteria:

All mother/caretakers of children more than three months of age to five years old at the day of the interview who were living in the study areas were eligible to be included in this study.

Exclusion criteria:

Selected subjects who were not present at the time of visiting were excluded from the study.

Data collection methods

Data were collected using the interview technique. In this method, the investigator interviewed the mothers/care takers of children below five years of age face to face on issues pertaining to diarrhea knowledge, attitude and practices. The questionnaire was structured and comprised of a set of issues on which the investigator wished to draw data using an interview guide to conduct the interview. The weight and height of under-five children were taken using the weighing scale and height taking scale respectively and recorded in the questionnaire.

Research instruments

A questionnaire, weighing scale and height scale were used as instruments for data collection. The questionnaire consisted five sections which included; a section on parents' (care takers') characteristics, child's characteristics, knowledge of diarrhea, attitude towards diarrhea, and practice in relation to diarrhea.

Knowledge: To assess the knowledge of respondents on diarrhea, questions on the signs and symptoms of diarrhea, its cause, spread and ways of prevention were asked. Under this section, ten questions were asked and respondents were required to identify the most correct answer from three options that were given. Of the three answer options given, only one was the correct answer. A score of 1 was given for each correct answer while a score of 0 was given for each of the wrong answers. The total score for each subject was calculated from all correct responses with a maximum of 10. This was then converted to a percentage and divided into tertiles. Those who scored below 40.0% were categorized as having low knowledge, 41.0 – 69.0% moderate, and >70.0% high knowledge which was predetermined before the study[20].

Attitude: Questions to determine the attitude of respondents towards diarrhea were asked. Respondents were asked to mention the extent to which they agreed or disagreed with the statements such a diarrhea being a health hazard to children's health, children's feaces being harmful, hand washing with soap before eating,

after visiting the toilet/latrine, before preparing food and before serving food. Respondents were also asked to mention the extent to which they agreed or disagreed with the statements like boiling drinking water being a prevention for diarrhea, diarrhea impacting on the household's economic situation, diarrhea being a preventable disease, diarrhea causing death in children and diarrhea resulting from poor sanitation. Mother/ caretakers' attitude towards diarrhea was classified into five categories according to likert scale. The categories included strongly agree, agree, fairly agree, disagree and strongly disagree. The study explored 10 questions using both positive and negative statements. For all positive statements, a score of five was given for strongly agree, four for agree, three for fairly agree, two for disagree and one for strongly disagree. A reverse score was given for the negative statements. These were analyzed and categorized into tertiles of negative attitude ≤16, neutral attitude = 17 - 33 and positive attitude ≥34[20].

Practice: The frequency of the following 10 practices was sought in this survey. Respondents were asked how often they washed hands with soap after visiting the latrine, how often they continued feeding the child with food on which a housefly had landed, how often they washed hands with soap before preparing food, how often they washed hands with soap before serving food, how often they used a toilet/latrine for defecation, how often they used the toilet/latrine to dispose of all children's feaces, how often children drunk treated/boiled water, how often they cleaned their house and environment, how often children's utensils were washed with hot water and how often they provided electrolyte balance like Oral Rehydration Salts (ORS) to a child with diarrhea. They were expected to answer never, once in a long time, sometimes, almost all the time, and all the time. Responses were analyzed and categorized into tertiles of poor practice ≤16, moderate practice = 17 - 33 and good practice ≥34[20].

Method of validity testing for structured questionnaire

The validity was tested by three experts and adjusted using the item objective congruence (IOC) technique developed by Rovinelli and Hambleton in 1977. The IOC technique was used for appropriate question identification. Questions were adjusted and corrected if the IOC value was found to be less than 0.5.[21].

Method of reliability testing for the questionnaire

Before being used in the field, all the questions were tested for reliability by means of pilot-testing with 10 people in an area with similar characteristics as the study area[21]. Attitude and practice questions were tested for reliability (chronbach's alpha) with the following results; attitude questions = 0.79, practice questions = 0.76. Whereas the whole set of knowledge questions had 0.78 by Kuder-Richardson 20 (KR-20).

Pretesting of data collection instruments

The questionnaire was pre-tested among households with children under- five years old in the community that is near the study area. The findings from the pre-testing exercise were used to revise the questionnaire.

Data collection procedure

Permission to conduct this study was sought from Kabarole district authorities. Anonymity and confidentiality of the respondents was observed by not asking the respondents to put their names on

the questionnaires. A covering letter from Mae Fah Luang University was used as an introductory letter to the relevant stakeholders.

Approval of this study was sought from the School of Health Science Mae Fah Luang University. Permission from the office of the District Health Officer (DHO) Kabarole and also from the administration of the selected sub county and division in Kabarole district was sought as well. The investigator explained to the participants in the study and a chance was given to them to ask for any clarifications on any points that could have not been clear.

Data was collected by interviewing child mother/ caretakers face–to-face, taking, reading and recording the weight and height of children less than five years old. In order to reduce data loss and missing data, the principle investigator and the research assistants rechecked for completeness of the information in the questionnaire after returning from the field each day after which data was entered into the database instantly.

Data analysis

Data analysis was carried out by using SPSS version 20, 2014 (SPSS, Chicago Illinoe). Statistical analysis was used to describe and account for the observed variability in the behavioral data and it involved analyzing the collected data. General information was analyzed using the descriptive statistics. Logistic regression was used to measure the association of dependent and independent variables.

Ethical Consideration

The confidentiality of respondents in this study was fully adhered to by not mentioning the names of study subjects and not availing personal information of study subjects to any one not involved in this study. The ethical committee of Mae Fah Luang University approved this study under certificate No. 95/2558.

Results

General characteristics of caretakers and children

Of the 367 sampled subjects, 363 participated in this study giving a response rate of 98.9%. The mean age of child care takers was 28.9 years old (14 to 76 years old) while that of children was 26.5 months old. Study findings indicated that 90.1% of the respondents were Christians while only 7.4% were Muslims. More than half of the children under this study were female, accounting for 51.2%. At least 79.9% of the respondents had attained some formal education while 20.1% had no formal education at all. Majority of the respondents (61.4%) reported that their household monthly income was less than UGX90, 000 meaning that they earned less than a dollar per day. (US$1 = UGX3,300). The average number of people per household was 5.1. The findings from the general characteristics of caretakers and children were illustrated in Table 1.

Table 1 Distribution of caretakers and children by general characteristics

Characteristics	n	%
Total	**363**	**100.0**
Sub County		
Rwimi	180	49.6
East Division	183	50.4
Age of caretaker (years)		
≤ 18	6	1.70
18 – 24	135	37.2
25 – 34	152	41.9
≥35	70	19.3
Min. = 14, Max. = 76, Mean. = 28.99, S.D. = 10.62		
Religion		
Christian	327	90.1
Moslem	27	7.4
Others	9	2.5
Education		
No Education	73	20.1
Primary school	182	50.0
Secondary school	80	22.2
Diploma	14	3.8
University	14	3.9
Occupation		
Peasant	264	72.5
Government worker	13	3.6
Company	11	3.0
NGO	7	1.9
Businessman/woman	68	18.7
Household monthly income (UGX)		
<90,000	223	61.4
90,000 – 500,000	121	33.4
>500,000	19	5.2
Number of children <5 years old		
<3	348	95.9
≥3	15	4.1
Number of family members aged >5 year olds		
≤3	74	20.4
4 – 6	227	62.5
7 – 9	41	11.3
≥10	21	5.8
Age of children(months)		
≤6	23	6.3
7 – 11	42	11.6
12 – 23	102	28.1
≥24	196	54.0
Min. = 3, Max. = 59, Mean. = 26.54, S.D. = 15.47		
Sex of children		
Male	175	48.8
Female	186	51.2

Assessment of the prevalence of diarrhea among children under five years old

The prevalence of diarrhea in children under five years old within the past seven days was 33.2% while that within the past 14 days was 48.6%. Diarrhea was mostly characterized with three to four loose stools per day with 91.2% of the children reported to have experienced this symptom. About 81.8% were reported to have experienced abdominal pain, and 79.6% had passed out blood or mucus in their stool.

Knowledge of mother/caretaker in relation to diarrhea

Results derived from the interview indicated that 83.5% of mothers/caretakers knew the passing out of loose stools three or more times per day as a symptom of diarrhea, 83.5% identified drinking untreated water as a cause of diarrhea, 83.5% mentioned the housefly as a vector for diarrhea, 83.5% singled out blood or mucus in stool as a danger sign for diarrhea, and 83.5% knew the use of ORS to prevent dehydration as the care given to the child with diarrhea in the home setting. Results further indicated that 79.1% mothers/caretakers mentioned eating of uncooked food as a means through which diarrhea could spread while 95.3% mentioned boiling of drinking water as the best method for treating water.

Regarding level of knowledge, results indicated that majority of respondents 81.5% had high knowledge about diarrhea, 14.9% had middle knowledge while only 3.6% had low knowledge.

Attitude of mother/caretaker in relation to diarrhea

Regarding level of attitude results indicated that majority of respondents 73.0%, had neutral level of attitude towards diarrhea, 25.9% had negative attitude while only 1.1% had positive attitude.

Practice of mother/caretaker in relation to diarrhea

Results from the study indicated that only 21.8% washed their hands with soap at all times, only 7.7% washed their hands with soap at all times before preparing food while only 10.2% washed their hands at all times before serving food. Only 54.5% used the toilet/latrine for defecation at all times and only 27.3% of the children drunk treated or boiled water all times. It was also discovered that majority of the mother/caretakers 90.6% had never washed a child's utensil with hot water. Only 43.3% of the mother/caretakers gave ORS at all times to the child with diarrhea.

Regarding level of practice, results indicated that only 21.5% of the mother/caretakers had good practice in relation to diarrhea, 45.7% had moderate practice while 32.8% had poor practice.

Results from simple logistic regression indicated that children who lived in households with caretakers aged between 18 – 24 years had greater opportunity to develop diarrhea (OR =3.46, 95%CI = 1.80 – 7.21). Compared to those above 24 years Results further indicated that increase in child age was associated with decrease in diarrhea occurrence. Children between 3 – 6 months old and 7 – 11 months old were 6.11 and 7.27 times respectively more likely to develop diarrhea than the older age categories (OR = 6.11, 95%CI = 2.55 – 15.45 and OR = 7.27, 95%CI = 3.61 – 15.26) respectively.

Subjects who lived in households with an income less than UGX90, 000 had greater opportunity of developing diarrhea than those whose households earned more than UGX90,000, (OR = 6.31, 95%CI

= 1.56 – 28.03) (Table 2).

Subjects who lived under the care of mother/caretakers with poor and moderate levels of practice were 28.84 and 4.19 times respectively more likely to develop diarrhea compared to those under the care of mother/caretakers with good practice (OR = 28.84, 95%CI = 12.76 – 65.89) and 4.10, 95%CI = 2.01 – 9.72) respectively.

Table 2 Association of child and parent characteristics with diarrhea occurrence

Characteristics	Diarrhea				Crude OR	95%CI	p-value
	Yes		No				
	n	(%)	n	(%)			
Caretaker age (years)							
≤ 17	1	(16.7)	5	(83.3)	1.07	0.23 – 10.21	0.951
18 - 24	53	(39.3)	82	(60.7)	3.46	1.80 – 7.21	0.001*
25 - 34	56	(36.8)	96	(63.2)	3.12	1.36 – 6.57	0.002*
≥ 35	11	(15.7)	59	(84.3)	1		
Child's age (months)							
≤6	15	(65.2)	8	(34.8)	6.11	2.55 – 15.45	<0.001*
7 -11	29	(69.0)	13	(31.0)	7.27	3.61 – 15.26	<0.001*
12 – 23	31	(30.4)	71	(69.6)	1.42	0.95 – 2.55	0.196
≥24	46	(23.5)	150	(76.5)	1		
Child's sex							
Male	63	(35.6)	114	(64.4)	1.22	0.78 -2.00	0.373
Female	58	(31.2)	128	(68.8)	1		
Child's BMI							
Underweight	66	(29.7)	156	(70.3)	0.71	0.57 – 1.28	0.187
Overweight	11	(61.1)	7	(38.9)	2.69	1.02 – 7.60	0.057*
Obesity	2	(22.2)	7	(77.8)	0.49	0.21 – 2.59	0.387
Normal weight	42	(36.8)	72	(63.2)	1		
Income level of							
caretakers (UGX)	95	(42.6)	128	(57.4)	6.31	1.56 – 28.03	0.015*
<90,000	24	(19.8)	97	(80.2)	2.10	0.57 – 9.85	0.341
90,000 – 500,000	2	(10.5)	17	(89.5)	1		
>500,000							
Occupation of caretakers	28	(39.4)	43	(60.6)	3.58	1.03 – 13.51	0.114
Peasant	59	(30.6)	134	(69.4)	2.42	0.79 – 8.92	0.260
Farmer	30	(44.1)	38	(55.9)	4.34	1.27 – 16.34	0.069*
Businessman/woman	4	(12.9)	27	(87.1)	1		
Formal employment							
Religion of caretakers	106	(32.4)	227	(67.6)	0.24	0.17 – 0.89	0.046
Christian	9	(33.3)	18	(66.7)	0.25	0.18 – 1.02	0.090*
Muslim	6	(66.7)	3	(33.3)	1		
Others							
Level of knowledge	7	(53.8)	6	(46.2)	2.29	1.01 – 5.95	0.147
Low	14	(25.9)	40	(74.1)	0.69	0.39 -1.18	0.259
Middle	100	(33.8)	196	(66.2)	1		
High							
Level of attitude	27	(28.7)	67	(71.3)	1.21	0.29 – 8.42	0.872
Negative	93	(35.1)	172	(64.9)	1.62	0.36 – 11.03	0.677
Neutral	1	(25.0)	3	(75.0)	1		
Positive							
Level of practice	79	(66.40)	40	(33.60)	28.84	12.76 –65.89	<0.001*
Poor	37	(22.30)	129	(77.70)	4.19	2.01 – 9.72	0.004*
Moderate	5	(6.40)	73	(93.60)	1		
Good							

*p-value <0.05, **p-value <0.01

Results from the multiple logistic regression revealed that children whose mothers/caretakers had poor level of practice (Adj. OR= 29.67, 95%CI= 10.40 – 84.62) had greater opportunity of developing diarrhea than those whose mother/caretaker had good practice (Table 3).

Results further revealed that children age ≥6 months (Adj. OR = 8.32, 95%CI = 2.42 – 28.54) and those aged 7 – 11 moths (Adj. OR = 8.97, 95%CI = 3.25 – 24.74) had greater opportunity of developing diarrhea compared to those who were 24 years old or older.

Table 3 Factors associated with diarrhea among children under-five years old using multiple logistic regression

Characteristics	Adj.OR	95%CI	p-value
Child's age (months)			
≤6	8.32	2.42 – 28.54	<0.001*
7 -11	8.97	3.25 – 24.75	0.001*
12 – 23	1.25	0.61 – 2.57	0.531
≥24	1		
Religion of caretakers			
Christian	0.07	0.01 – 0.45	0.005*
Muslim	0.08	0.01 – 0.65	0.019*
Others	1		
Level of practice			
Poor	29.67	10.40 –84.62	<0.001*
Moderate	3.27	1.16 – 9.17	0.024*
Good	1		

*p-value < 0.05

Discussion

Diarrhea prevalence for seven days preceding the date of data collection was found to be 33.2% while that of 14 days preceding the date of data collection was 48.6%. The findings of diarrhea within the past seven days Ref. (33.2%) were close to the findings by Bbaale[17] who in his study on determinants of diarrhea and acute respiratory infections among under-fives in Uganda found out that diarrhea prevalence was 32.0%. The study findings were also found to be similar to Santos[22] in his study on water related factors and childhood diarrhea in African informal settlements in Burkina Faso. On the contrary, findings of this study on the prevalence of diarrhea were different from those of Yilgwan[23] who in his study on the prevalence of diarrhea disease and risk factors in Jos University Teaching Hospital, Nigeria found the prevalence of diarrhea among children to be only 2.7%. Such a great difference in the findings of this study and that of Yilgwan could be due to the difference in the study methodologies. While this was a community based study, that one of Yilgwan was hospital based. Yilgwan's study could therefore have missed out on a number of diarrhea cases that did not visit the hospital for treatment, leading to a very low prevalence therein. By collecting data from randomly selected subjects, such a selection bias was eliminated by this study. Again this 33.2% diarrhea prevalence within seven days that was found out in this study was not in agreement with the 9.8% prevalence of childhood diarrhea that was reported by Avachat et al[24] in a cross-sectional study of socio-demographic determinants of diarrhea among children under five of rural area of Western Maharashtra, India. Such a difference could be attributed to the difference in geographical settings, and difference in both quantity and quality of health and social services between the two countries. Such a difference is also in line with WHO's[25] report that Sub Saharan countries were the most burdened countries with diarrhea among children less than five years old.

Study finding from knowledge, attitude and practices revealed that 81.5% of mother/caretakers had a high knowledge, 73.0% had a neutral attitude while only 21.5% had a good level of practice in relation to diarrhea. This was a clear downward trend from knowledge through attitude to practice. It can therefore be concluded that this study revealed a total mismatch between knowledge and practice. This means that that even though mother/caretakers demonstrated vast knowledge and neutral attitude towards diarrhea, their practices remained poor, hence the high diarrhea prevalence in the study area as revealed by this study. This finding is in agreement with Natalie et al.[26] who mentioned in their study that there existed a mismatch between knowledge and practice among his study subjects. From this study, it can therefore be concluded that it is not what is known that will help prevent and control diarrhea occurrence but rather what is done. This study therefore highlights the importance of good hygiene practices in diarrhea prevention and control. A slight change in practice can lead to significant changes in diarrhea occurrence.

Results from multiple logistic regression showed that children under the care of mothers/caretakers that had a poor level practice and moderate level of practice in relation to diarrhea were more likely to develop diarrhea than those under the care of mothers/caretakers with good practice. The results on poor practice are in agreement with Wahed et al.[27] who

in their study found out a significant association between the respondents' practice and diarrhea. While the results on moderate practice are in contrast with Agustina et al.[28] who mentioned that moderate levels of practice and experience were associated with decreased diarrheal risk.

Results from the simple logistic regression showed decrease in diarrhea risk with increase in child's age. These findings are in agreement with Yilgwan's study in which it was found out that diarrhea was most common among children of around six months old[23]. These finding are in agreement with WHO[25], which states that diarrheal disease is highest in children under 24 months and especially between six and eleven months. This pattern could be due to poor immune status and poor weaning practices especially with poorly nutritive, bulky and heavily contaminated foods.

Study finding revealed that underweight children were more likely to develop diarrhea than their counterparts. This finding is in line with Subhada et al.[29] who stated that Malnutrition was significantly associated with recurrent diarrhea and 21.00% of malnourished children had the same. Escobar et al.[30] further reaffirms this in his study on diarrhea and health inequity among Indigenous children in Brazil where he found out that under nutrition was a risk factor for diarrhea.

Results from the simple logistic regression further revealed that children who lived in households that had a monthly income of less than UGX90,000 were more likely to develop diarrhea than their counterparts. These findings are in line with Samer et al.[31], who in a case control study on predictors of acute diarrhea among hospitalized children in Gaza governorates found out that family income had a significant association with childhood diarrhea.

Finding from this study further revealed that children whose mother/caretakers were businessmen/women were more likely to contract diarrhea than their counterparts. This finding does not contradict the findings by Rish et al.[32] who revealed that mothers who were farmers were a protective factor against diarrhea.

Among the strengths of this study is the fact that it was community based and it involved data collection from the population that was used to describe the situation within in the short time that was available. The randomization during the selection of the study population was a significant strength for this study as well. Additionally, the study had a high response rate (98.9%). Nevertheless, this being a cross-sectional Study, its limitation lies in its less statistical power to measure the causal relationships between the risk factors and diarrhea among children less than five years old. A case control study is better suited to measure such a relationship.

This study focused mainly on the knowledge, attitude, and practices (KAP) of mothers/caretakers of children under five years and thus did not include other variables that could relate to diarrhea in general. Therefore, in further study should include environmental factors related to diarrhea.

Conclusion

This study demonstrates that diarrhea prevalence among children less than five years old in Kabarole district in Uganda is high, standing at 33.20%. The associated risk factors for diarrhea include mother/caretaker poor and moderate levels of practice, child's

age, child being unde weight, household monthly income less that UGX90,000, and caretaker occupation.

Recommendations

This study has brought to light the mismatch between knowledge and practice. Study finding indicated that even though majority 81.5% of the respondents had high knowledge about diarrhea and its risk factors, only a handful 21.5% had good practice in relation to diarrhea. This study therefore recommends that health workers and non-governmental organizations should develop, and/or adopt and implement feasible behavioural change models with in the target communities. This will enhance the adoption of good practices in relation to diarrhea among community members.

Health workers and non-governmental organizations should desist from using programs that are often developed solely from a logic model, or formative qualitative research. These are relevant, but limited in scope. The community led total sanitation (CLTS) is an example of a good behavioral change model that could be adopted to enhance adoption of good practices.

The people in the study area should transform their knowledge of the diarrhea and its risk factors into good practices. They should adopt good hygiene practices and be able to put into practice what they learn and know.

The district local government should engage the community members in income generating activities to enhance household incomes. This will enable households take charge of their health needs and will enable households afford a balanced diet which in turn will boost the immunity of children, preventing diarrhea occurrence therein.

Health workers should engage in community campaigns on good nutrition practices. This will not only increase awareness on good nutrition, but will also lead to the adoption of good nutrition practices for children, preventing underweight and subsequent diarrhea therein.

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