

# Mothers' knowledge, attitudes and practices on preventing diarrhoea in Juba, South Sudan

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**Introduction:** In South Sudan, diarrhoeal diseases are leading causes of mortality and morbidity among young children.

**Objective:** To assess mothers' knowledge, attitudes and practices (KAP) on how to prevent diarrhoea among under-five year old children at the United Nation's Mission in South Sudan Protection of Civilian Sites in Juba.

**Methods:** A cross-sectional study was conducted in August 2017 using a four stage sampling technique and analysed using EpiData version 3.1 and SPSS version 20.

**Results:** A total of 410 mothers (98.6% of the selected sample) responded to the study questionnaire; 45.6% were aged 25-34 years, 52.7% were illiterate, 93.9% were housewives, and 84.6% had no source of income. The majority (62%) had a 'low' knowledge, 65.4% had positive attitudes and 57.8% had 'poor' practices; significant associations were observed between: age and attitude, knowledge and education, practices and education, and diarrhoea and income.

**Conclusion:** Many mothers need more knowledge and better attitudes and practices to be able to prevent and manage their children's diarrhoea. The associations between knowledge, attitudes and practices all indicate the need for increased education and schooling of South Sudanese women and girls.

**Key words:** mothers' knowledge, attitude and practices, diarrhoea, prevention, South Sudan.

## INTRODUCTION

Social factors such as mothers' knowledge, attitudes and practices (KAP) related to the prevention of diarrhoea influence child health and survival <sup>[1]</sup>. We used the World Health Organization (WHO) definition of diarrhoea <sup>[2]</sup> Diarrhoeal diseases are leading causes of young child morbidity and mortality in South Sudan <sup>[3]</sup>.

In 2014 the two-week point prevalence of diarrhoea among under-five year old children in Rubkona POCS, Unity State was estimated to be 43.6 % <sup>[4]</sup>.

## METHODOLOGY

A descriptive community-based cross-sectional study was conducted in August, 2017 at the United Nations Mission in South Sudan (UNMISS) Protection of Civilian Site 3 (POCS 3) in Juba. This is one of two camps hosting >38,000 people displaced by the December 2013 Juba conflict.

A mixed four stage sampling procedure was employed to select households with mothers who had children aged under five years.

- Stage 1: one of the POCS (1 and 3) was randomly selected using the lottery method (POCS 3 was selected).

- Stage 2: 6 zones (from the total ten zones) were randomly selected using lottery method.
- Stage 3: a proportion to size allocation of the number of households was done (i.e. by allocating the total sample size of 416 to the 6 selected zones) so 69.3 households were allocated to each zone.
- Stage 4: the starting household for each zone was selected by throwing a pen down in the centre of the zone; the household to which the pen's lid pointed was the starting household; then the data collectors moved systematically to the right.

Sample size was calculated using a single population proportion formula by assuming that 43.6% of under-five year old children have diarrhoea, (according to the UNMISS Rubkona/Bentiw POCS study in 2014 <sup>[4]</sup>) with 95% confidence level, level of precision 5% for four stage sampling and 10% added for non-responses. The estimated total sample size was 416. The study was approved by the Southern Medical University, Guangzhou and permission was obtained from the camp authorities. The purpose of the interview was explained to the respondents, almost all of whom were mothers ('mothers' here includes the very few caretakers), and oral consent was obtained from them. Data were collected by trained data collectors using a questionnaire translated into Nuer <sup>[5]</sup>.

Data were entered using EpiData software version 3.1 and exported into Excel for further cleaning where SPSS version 20 was used for the final analysis. The data were presented as frequency tables and means and proportions were calculated. Pearson's Chi-square and Fisher's exact test were used to find the association between socio-demographic variables and other variables.

There were 5 questions for knowledge, 7 for attitudes and 9 for practices. Each question was given one to three points depending on the number of multiple choices and importance of the question [6].

For the questions on knowledge there were 10 points and the grade of knowledge for each level of score was:

- <6 points = low,
- 6-8 points = medium,
- 8 points = high.

For the questions on attitudes there were 11 points, and attitude was graded as negative and positive depending on the total scores. Those who scored equal to or less than the mean were labelled negative while a score above the mean was labelled positive [7].

For the questions on practices, there were 13 points and practice was graded as poor and good based on the total scores. A score equal to or less than the mean was labelled 'poor' while a score above the mean was labelled 'good' [7].

## RESULTS

### Demographic and socio-economic characteristics

From 416 mothers, 410 responded to the questionnaire; Table 1 shows the mothers' ages, educational levels, occupation and sources of income.

### Knowledge of diarrhoea (Table 2)

Of the 410 mothers:

- 237 (57.8%) gave a correct definition of diarrhoea,
- 305 (74.4%) stated that diarrhoea was due to contaminated food,
- 255 (62.2%) mentioned sunken eyes as the common sign of dehydration,
- 186 (45.4%) mentioned loss of weight as the consequence of diarrhoea,
- 391 (95.4%) knew that oral rehydration solution (ORS) is given to prevent dehydration,
- 242 (59%) did not mention zinc in the treatment of diarrhoea,
- 254 (62%) had low level of knowledge.

### Attitudes to diarrhoea

Almost all the mothers (400) want treatment when their children have diarrhoea; 379 (92.4%) prefer a public health

**Table 1. Demographic and socio-economic characteristics of the 410 mothers**

Socio-demographic variable	n	%	
<b>Age (years)</b>	15-24	141	34.4
	25-34	187	45.6
	35-44	64	15.6
	> 45	18	4.4
<b>Educational level</b>	No schooling	216	52.7
	Primary	139	33.9
	Secondary	50	12.2
	College / higher	5	1.2
<b>Occupation</b>	House wife	385	93.9
	Trader	10	2.4
	NGO worker	12	2.9
	Others	3	0.7
<b>Income for the family</b>	Yes	63	15.4
	No	347	84.6

**Table 2. Mothers' level of knowledge of diarrhoea**

Knowledge level	n	%
<b>Low</b>	254	62.0
<b>Medium</b>	154	37.6
<b>High</b>	2	0.49
<b>Total</b>	410	100.0

**Table 3. Mothers' attitudes to diarrhoea**

Attitude level	n	%
<b>Negative</b>	142	34.6
<b>Positive</b>	268	65.4
<b>Total</b>	410	100

**Table 4. Mothers' level of practice in preventing diarrhoea**

Practice level	n	%
<b>Poor</b>	237	57.8
<b>Good</b>	173	42.2
<b>Total</b>	410	100

facility, and 347 (84.6%) want immediate treatment. During an episode of diarrhoea, 251 (61.2%) mothers said they want children to receive ORS, 344 (83.9%) want other fluids, 332 (81%) preferred breastfeeding and other fluids. Table 3 shows mothers' attitudes to diarrhoea.

**Practices on the prevention of diarrhoea**

Most mothers (392) had breastfed their children of whom 183 (46.7%) had breastfeed for 23 months. At the time of the survey, 263 (64.1%) mothers were partially breast feeding, and 193 (47.1%) were giving powder milk.

On hygiene the mothers reported the following practices:

- 330 (80.5%) wash their hands before preparing food and eating, of whom 339 (82.7%) use soap,
- 229 (55.9%) treat their water, of whom 170 (74.2%) add chlorine,
- 377 (92%) cover their water containers,

- 408 (99.5%) have latrines of which 403 (98.8%) were public ones.

Table 4 ranks the mothers' levels of practice.

**Prevalence of diarrhea**

In the previous two weeks 236 (57.6%) mothers said that their children had had diarrhoea (Figure 1)

**Association of variables**

Association was observed between the following variables: Education versus Knowledge ( $X^2 = 24.8, P = < 0.000$ ), age versus Attitude ( $X^2 = 16.4, P = < 0.000$ ), Education versus Practice ( $X^2 = 20.8, P = < 0.000$ ) and Income versus Diarrhoea ( $X^2 = 16.6, P = < 0.007$ ).

Table 5 shows there is a strong association between knowledge and level of education. Illiterate mothers tend to have low knowledge (standardized residual = 3.31) compared to those with secondary education (standardized

**Table 5. Cross-classification of mothers' knowledge of diarrhoea and education, with expected frequencies and standardized residuals**

	Knowledge			$X^2$	P- value
Education	Low	Medium/High	Total		
No schooling	150	66	216		
	133.8	82.2			
	3.31	-3.31			
Primary	84	55	139		
	86.1	52.9		20.63	< 0.001
	-0.45	0.45			
Secondary and above	20	35	55		
	34.1	20.9			
	-4.20	4.20			
Total	254 (62%)	156 (38%)	410		

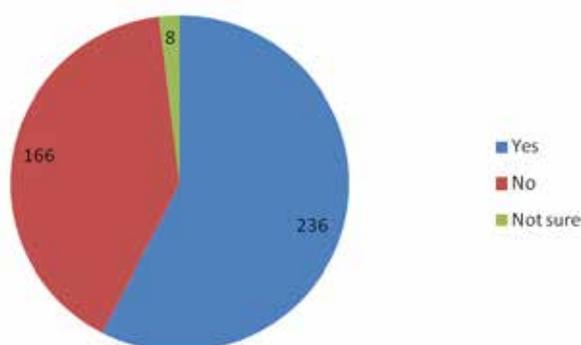


Figure 1. Prevalence of diarrhea among under-five children

**Table 6. Mothers' attitude to diarrhoea and age cross tabulated frequencies, with expected frequencies and standardized residuals**

	Attitude			$X^2$	P- value
Age	Negative	Positive	Total		
≤ 34	98	230	328		
	113.6	214.4			
	-4.06	4.06		16.39	< 0.001
>35	44	38	82		
	28.4	53.6			
	4.06	-4.06			
Total	142 (35%)	268 (65%)	410		

residual = -4.20). Overall about 4 in 10 mothers have medium to high knowledge of diarrhoea.

Table 6 shows that younger mothers exhibit more positive attitudes (standardized residual = 4.06) than older ones (-4.06). This result can also be linked to education, as younger mothers tend to be more educated than older ones. Moreover, about 2 in 3 mothers have positive attitudes to diarrhoea.

Table 7 shows that mothers with no schooling have poor practices in preventing diarrhoea (standardized residual = 3.85) compared to those with primary education (standardized residual = -3.93). This implies some level of education does improve mother's practice to prevent diarrhoea. About 2 in 5 mothers show good practice in preventing diarrhoea among children.

Cases of diarrhoea that occurred within the last 15 days of the survey were reported more by mothers without income (Table 8) (standardized residual = 5.9) than by either low income mothers (standardized residual = -5.2) or those with medium to high income (-2.53).

### DISCUSSION

Our study is first of its kind; no similar study had been conducted previously in South Sudan.

More of our mothers: know the correct definition of diarrhoea, its causes and signs, and use of ORS compared to those in a 2010 survey in Sudan [8]. There was a strong association between mothers' knowledge and level of education. Illiterate mothers tend to have low knowledge compared to those with secondary education. (Table 5); this would suggest the need to support female education because in South Sudan prevalence of illiteracy is very high especially among females [9], also majority of our mothers/ care givers have not had any schooling.

**Table 7. Mothers' practice and education cross tabulated frequencies, with expected frequencies and standardized residuals**

Education	Practice		Total	X <sup>2</sup>	P-value
	Poor	Good			
No schooling	144	72	216	20.7	< 0.001
	124.9	91.1			
	3.85	-3.85			
Primary	59	80	139	20.7	< 0.001
	80.3	58.7			
	-3.93	3.93			
Secondary and above	34	21	55	20.7	< 0.001
	31.8	23.2			
	0.08	-0.08			
<b>Total</b>	237(58%)	173(42%)	410		

Younger mothers exhibited more positive attitudes than older ones. This result can also be linked to education, as younger mothers tend to be more educated than older ones.

Most of our mothers stated that they had breast fed their children; which was consistence with another study in South Sudan [10]. There was no any significant association found between breast feeding and diarrhoea, but there was between mother's income and child's diarrhoea. Cases of diarrhoea that occurred within the last 15 days of the survey were reported more by mothers without income

**Table 8. Diarrhoea incidents and mothers' income cross tabulated frequencies, with expected frequencies and standardized residuals**

Income Level	Diarrhoea			Total	X <sup>2</sup>	P-value
	Yes	No	Not ure			
No Income	221	122	4	347	24.7	< 0.001
	199.7	140.5	6.8			
	5.9	-5.16	-2.8			
Low Income	8	31	2	41	24.7	< 0.001
	23.6	16.6	0.8			
	-5.2	4.8	1.4			
Medium/High Income	7	13	2	22	24.7	< 0.001
	12.7	8.9	0.4			
	-2.53	1.83	2.63			
<b>Total</b>	236 (58%)	166 (40%)	8 (2%)	410		

than by either low income mothers or those with medium to high income. This means that even a small income for a mother can reduce the incidence of diarrhoea in children.

Most of our mothers reported washing their hands before preparing food and eating which was better than findings in IDPs camps in Kabul <sup>[11]</sup>; most used soap and water which was similar with another survey in South Sudan <sup>[12]</sup>. These similarities and differences may be attributed to differences and similarities in access to health education and other factors, for example, Juba IDPs were more exposed to health education especially on topics related to hygiene and sanitation in the community and in health facilities.

From Table 7 it is clear that mothers with no schooling have poor practices in preventing diarrhoea compared to those with primary education. This again implies the importance of mothers' education in preventing diarrhoea among their young children.

### CONCLUSION

Many mothers need more knowledge, better attitudes and practices in order to improve the prevention and management of their children's diarrhoea. The associations between knowledge, attitudes and practices all indicate the need for increased education and schooling of South Sudanese women and girls.

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### References

1. Bertrand WE, Walmus BF. Maternal knowledge, attitudes and practice as predictors of diarrhoeal disease in young children. *Int J Epidemiol.* 1983; 12(2):205-10.
2. Wardlaw T, Salama P, Brocklehurst C, Chopra M, Mason E. Diarrhoea: why children are still dying and what can be done. *Lancet* 2010;375(9718):870-2
3. Stephen AJ, Murila FV, Wamalwa D. Management of acute diarrhea among children aged 6-59 months admitted at Juba Teaching Hospital. *South Sudan Medical Journal.* 2017; 10(1)
4. Thwol ET. Academic Article Prevalence of Diarrhea and Malaria among under-five children in Rubkona IDPS. 2015.
5. Angesom T, Prevalence and Associated factors of Diarrhea among under-Five Children in Laelay-Machew District, Tigray Regional State, Ethiopia, 2015.
6. Ebunoha Helen U. childhood diarrhea knowledge and management practices of childbearing mothers in Ezeagu L.G.A of Enugu State, Nigeria, 2011.
7. Mach BS. HIV/AIDS knowledge, attitudes and practices among women in South Sudan based on Multiple Indicator Cluster Survey, 2010 *J Health Res* 2017; 31(suppl.1): S65-74. DOI: 10.14456/jhr. 2017.69
8. Haroun HM, Mahfouz MS, Mukhtar ME, Salah A. Assessment of the effect of health education on mothers in Al Maki area, Gezira State, to improve homecare for children under five with diarrhoea. *J Family Community Med.* 2010; 17:141-6.
9. Health Sector Development Plan. 2011-2015, Government of South Sudan, Ministry of Health.
10. Gore RP, Lomeling FT, Kareialla AH, Fabiano WBA, Mabil CD, Daniel WN, et al. The associated factors hampering mothers towards exclusive breastfeeding through knowledge, attitude and practice (KAP) studies at Al-Sabah Children Hospital /Juba -South Sudan. *J Community Med Public Health: CMPH-101.* 2017.
11. Mubarak MY, Wagner AL, Asami M, Carlson BF, Boulton ML. Hygienic practices and diarrheal illness among persons living in at-risk settings in Kabul, Afghanistan: a cross-sectional study. *BMC Infect Dis.* 2016; 16:459.
12. ACF International, WASH Baseline Knowledge, Attitude and Practice, Survey Report, Gogrial West County Warrap State, South Sudan, 2012.