

Research Article

Mothers' Knowledge, Attitude and Practice Regarding Diarrhea and its Management in Morang Nepal: An Interventional Study

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Abstract

Purpose: To assess diarrhea-related knowledge, attitude and practice through successive educational interventions.

Methods: This was an interventional study conducted at nine different locations of Morang district, Nepal from March 2010 to January 2011. Multistage random sampling approach was adopted to sample 630 subjects and they were randomly assigned to test and control groups. The subjects in the test group were provided an educational intervention designed on the basis of World Health Organization guidelines. Data collection followed by intervention was conducted at baseline, 1 month and 3 months; at 6 months, only data were taken without intervention.

Results: About 90 % of the mothers were from the age group 16-30 years and most (93 %) of them were agricultural laborers. A majority (> 62%) of the mothers were not educated. Educational interventions brought about significant improvement in knowledge, attitude and practice at 1st, 2nd and 3rd follow-up. The median scores of knowledge, attitude and practice increased from 14, 7, 6 to 26, 9, 13, respectively, due to repeated interventions. Furthermore, interventions strengthened the correlation between knowledge, attitude and practice.

Conclusion: Intervention was beneficial in improving mothers' knowledge, attitude and practice regarding diarrhea and its management.

Keywords: Attitude, Diarrhea, Intervention, Knowledge, Mothers, Practice

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INTRODUCTION

Diarrhea is a major public health problem in Nepal as evident from its increasing incidence and fatality [1]. Unlike other diseases, diarrhea is generally not considered as an illness and, thus most diarrheal cases are either not managed at all or managed at home through traditional approaches [2]. About one half of children under five years are not taken to any healthcare center and about one-third of the children with diarrhea do not receive any treatment at all [3].

Managing diarrhea at home is quite common among rural mothers, but their level of knowledge is poor [4]. Perception of the seriousness of diarrhea or other health-related conditions is a paramount factor for seeking healthcare [5]. There is a practice of reducing and even stopping fluids during diarrhea [6,7]. Despite universal popularity of oral rehydration solution (ORS) in preventing dehydration due to diarrhea, its use in practice is very low [4,8]. The poor practice of using ORS is accompanied by its incorrect preparation which is related to lack of mothers' prior experience [9,10].

The present study was conducted with the objectives of determining mothers' knowledge, attitude and practice about diarrhea and its management at home and to evaluate the effects of educational interventions undertaken at different specified time intervals on these parameters.

METHODS

The study was approved by the Research and Ethics Committee of Nobel Medical College, Biratnagar, Nepal.

Study design

This was an interventional study involving multiple follow-up.

Study duration and location

The study was carried out from March 2010 to January 2011 at Baijnathpur, Bhaudaha, Budhanagar, Kadmaha, Kathari, Lakhantari, Siswanijahada, Tankisinuwari Village Development Committees and Biratnagar municipality of the Morang district, Nepal.

Study population

The study population was the mothers in south-west region of Morang district, Nepal. The study was multiple interventional requiring repeated follow-up. Thus, this area was selected for the ease of multiple visits from the main city, Biratnagar. The mothers were targeted as the study population because they are the immediate and most reliable caregivers to their children and, thus their knowledge, attitude and practices are more significant compared to the other family members. The subjects were eligible to be enrolled in the study if they were between the age of 16 - 40 years, had child/children with diarrhea at the time of enrollment or in the preceding 3 to 6 months from the time of enrollment and willing to participate in the study.

Sample size and sampling procedure

The effect size of 0.75 and standard deviation of outcome variable of 3.35 was used from the similar study conducted in the Philippine [11]. The minimal sample size to see the difference with a power of 80 % at 95 % confidence level was determined as 315 in each group by using sample size formula for difference in means, shown in Eq 1.

$$n = \frac{2 \sigma^2 (Z_{\beta} + Z_{\alpha/2})^2}{d^2}$$

where **n** is sample size in each group (assumes equal sized groups), **Z_β** is desired power 80 % (**Z_β** = 0.84), **Z_{α/2}** is desired level of statistical significance of 5% (**Z_{α/2}** = 1.96), **σ** is standard deviation of the outcome

variable and **d** is effect size (the difference in means).

By considering a drop-out, e.g. loss to follow-up margin of 5 %, the total sample size in both the groups was calculated as $315 \times 2 = 630 + (630 \times 5\%) = 662$. A drop-out rate of 30 subjects was estimated by the completion of the study. Thus, the final sample size of 632 was targeted in the study, i.e., 316 subjects per group. Multi-stage random sampling method was used to select the subjects. The selected region was divided into three units (subdivisions) each containing three Village Development Committees. Village Development Committee (VDC) is a group of villages in rural Nepal which has a sub-health post (SHP) as a

government health institution and this is the first contact point for seeking healthcare for the local population. A sample of 630 subjects (210 from each of the three units) meeting the inclusion criteria were taken out from the patient register of the government health institutions (Figure 1). It was then segregated into two groups based on diarrhea at present (group I) and diarrhea in preceding 3 to 6 months (group II). The subjects were numbered separately for each group. For group I, the subjects were randomly assigned to test (test I) and control (control I) groups based on odd and even numbers respectively. The same procedure of randomization was applied in the case of group II to assign into test (test II) and control (control II).

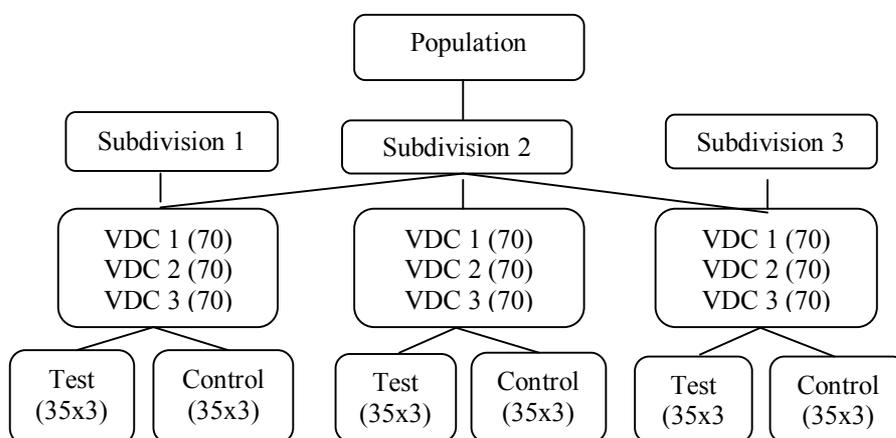


Figure 1: Sampling (multi-stage random sampling) design

Instrument

The instrument was a survey-type questionnaire containing questions related to knowledge, attitude and practice about diarrhea and its management. The first draft of the instrument containing 29 questions was piloted among 15 subjects and the reliability coefficient (Cronbach's alpha value) was found as 0.585. Furthermore, almost all subjects were unable to rate their attitude in a 5-point Likert scale (i.e., strongly disagree, disagree, undecided, agree, strongly agree). Thus, necessary amendments were made in

the instrument. The modified instrument was again tested among another 35 subjects whose reliability coefficient was 0.78 [12]. The instrument was reviewed by a panel of experts to ascertain the face validity. Besides this, the instrument was validated through factor analysis. Measures of sample adequacy such as Bartlett's test of sphericity ($p < 0.001$ and Kaiser Meyer Olkin (KMO) value of 0.893 showed that data were fit for factor analysis. Principal Component analysis was used for extracting factors and four factors were retained depending on eigenvalues and variance explained which

accounts for 80% of the variance. Factor 1 is predominant with an eigenvalue of 15.10%. Components 1 and 2 explain or capture much more of the variance than the remaining components. Varimax rotated component matrix shows that most of the items load quite strongly (> 0.4) on the first and third components. Very few items load on Components 2 and 4.

Interventions and data collection

The interventions were carried out in the form of educational sessions (containing both text as well as pictures about the importance of hygiene, breast feeding during diarrhea, habit of hand washing after defecation, use of safe water, safe disposal of stool, beneficial as well as harmful foods and fluids, danger signs of dehydration, correct preparation of ORS and SSW solutions, their importance and doses) as per the protocol. The intervention protocol was developed on the basis of United States Agency for International Development (USAID) and WHO guidelines [13,14]. Before being formally enrolled in the study, the subjects were fully informed about the research and their written consent obtained. At the time of enrolling the subjects, their detailed home address along with contact number, if any, and name of the guardian were recorded for the ease of follow up visits. At the first interview (at the time of enrollment), data on demography along with baseline data on mothers' knowledge, attitude and practices about diarrhea and its management were gathered. After collecting the baseline data, the subjects were provided an educational intervention immediately. This process of interview followed by intervention was continued at second visit (after one month) and at third visit (after 3 months from the time of enrollment) while in the case of fourth visit (after 6 months from the time of enrollment), only interview was conducted without any intervention. The process of interview followed by intervention was performed only in test groups, but the subjects in control groups were interviewed each time without providing any intervention.

Data analyses

The responses were coded, entered and verified before analysis using Statistical Package for Social Science (SPSS), version 11.5, for Windows, Chicago Inc. Appropriate statistical tests were used to carry out descriptive as well as inferential analyses of the data based on the objectives. A priori significance level of 0.05 was used in all analyses.

RESULTS

Based on gender, male children (55.5 %) were found more prone to diarrhea than their female counterpart (44.5%). Although diarrhea was common in all the age groups of the children at six months onwards, the age groups 36 - 45 months and 12 - 23 months had relatively more episodes of diarrhea. The median age and inter-quartile range (IQR) of the children was 24 (12 - 40) months. About 90 % of the mothers were from the age group 16 - 30 years with a median (IQR) of 25 (22 - 28). Occupation wise, mothers were mostly (93%) housewives and were agricultural laborers. The remaining mothers were engaged in teaching, shop-keeping, tailoring and other occupations. A majority (> 62 %) of the mothers was not educated (Table 1). The mothers represented about 28 ethnic castes, but majorities (63%) of them were Rishidev, Muslims, Sardar, Sonar, Mandal and Jhangad. Other castes were Rajbanshi, Tharu, Magar, Newar, Kamat, Harijan, Paswan, Mukhiya, Malah, Santhal and Sattar. The median total family size (IQR) was 5 (4 - 7) and the median (IQR) number of children was 2 (2 - 3). A majority (65 %) of the women's husbands were industrial hard labor employees with a median (IQR) monthly income of Nepalese Rupees 6000 (5000 - 7000) = US\$ 73.10 (60.91 - 85.28).

Comparison of knowledge, attitude and practice between test groups

Mann-Whitney *U* test found that there were no statistically significant differences in

scores at baseline. However, statistically significant differences were observed only in knowledge, practice and total scores were ($p < 0.001$) at first follow up.

Table 1: Demographic characteristics of the subjects (n = 632)

Characteristics	Number	%
Child's age		
<6 months	06	0.9
6-11 months	116	18.4
12-23 months	140	22.2
24-35 months	131	20.7
>35 months	239	37.8
Mother's age		
16-25 years	396	62.6
26-30 years	171	27.1
>30 years	65	10.3
Mothers' education		
No education	393	62.2
Primary	170	26.9
Secondary and higher	69	10.9
Monthly income (Nepalese Rupees)		
Up to 5000	248	39.2
5001-10000	331	52.4
>10000	53	08.4

Repeated measure analysis of intervention on knowledge, attitude and practice scores

Friedman test was used to detect differences in treatments across multiple test attempts which was significant in all the cases, i.e. test-I and test-II groups (Table 2). To examine where the differences actually occur, post-hoc analysis with Wilcoxon

signed rank test was conducted with a Bonferroni correction applied, resulting in a significance level set at $p < 0.004$. The Bonferroni correction is applied to maintain family-wise error rate (the probability of making type I errors among all the hypotheses while performing multiple pairwise tests) on a set of data. So, if the significance level for the whole family of tests is α , then the Bonferroni correction would be to test each of the individual tests at a significance level of α/n .

Comparison of knowledge, attitude and practice between test and control (group I)

Mann-Whitney *U* test ascertained that there were statistically significant differences in the scores between the groups at first, second and third follow-ups (Table 3).

Comparison of knowledge, attitude and practice between test and control (group II)

As in group I, Mann-Whitney *U* test found similar pattern of statistically significant differences in the scores between the groups (test-II and Control-II) at first, and second and third follow ups.

Correlation between knowledge, attitude and practice

Spearman correlation test showed statistically significant relationship between

Table 2: Repeated measure analysis of test on knowledge, attitude, practice and KAP scores (n=316)

Variables	Baseline Median (IQR)	1 st F/U Median (IQR)	2 nd F/U Median (IQR)	3 rd F/U Median (IQR)	P-value
Test-I group					
K-Score	14 (12-15)	21.5 (18.75- 26)	26 (23-33)	23 (20-30)	<0.001*
A-Score	7 (6-8)	8 (7.75-9)	9 (8-9)	9 (8-9)	<0.001*
P-Score	6 (5-7)	10 (9-12)	12 (10-15)	13 (10-16)	<0.001*
KAP-Score	27 (25-29)	40 (36.75-45)	47 (42-56)	43 (39-52.25)	<0.001*
Test-II group					
K-Score	14 (12-15)	19 (16-22)	27 (23-32)	26 (20.75-33)	<0.001*
A-Score	7 (6-8)	8 (7-9)	9 (8-9)	9 (8-9)	<0.001*
P-Score	6 (5-7)	8 (7-10)	11.5 (10-14)	10 (8-14)	<0.001*
KAP-Score	27 (24-29)	35 (31-40)	48 (41-54)	45 (38.75-54.25)	<0.001*

*Difference was significant at the 0.05 level (2-tailed); P-value was calculated with Friedman test

Table 3: Comparison of knowledge, attitude, practice and KAP scores between test-I and control-I groups (n = 316)

Variable	Test-I group Median (IQR)	Control-I group Median (IQR)	P-value
Baseline			
K-score	14 (12-15)	14 (13-16)	0.516
A-score	7 (6-8)	7 (6-8)	0.043*
P-score	6 (5-7)	6 (5-7)	0.711
KAP-score	27 (25-29)	26 (24-29.25)	0.608
First F/U			
K-score	21.5 (18.75-26)	14 (12-15)	<0.001*
A-score	8 (7.75-9)	7 (6-8)	<0.001*
P-score	10 (9-12)	6 (5.75-7)	<0.001*
KAP-score	40 (36.75-45)	27 (25-29)	<0.001*
Second F/U			
K-score	26 (23-33)	15 (13-16)	<0.001*
A-score	9 (8-9)	7 (6-7)	<0.001*
P-score	12 (10-15)	6 (6-7)	<0.001*
KAP-score	47 (42-56)	28 (26-30)	<0.001*
Third F/U			
K-score	23 (20-30)	15 (13-16)	<0.001*
A-score	9 (8-9)	7 (6-7.25)	<0.001*
P-score	13 (10-16)	6 (6-7)	<0.001*
KAP-score	43 (39-52.25)	28 (26-30)	<0.001*

*Difference was significant at the 0.05 level (2-tailed); P-value was calculated by Mann-Whitney U test

Table 4: Correlation between K-score and A-score, K-score and P-score, and A-score and P-score

Variables	Median (IQR)	Median (IQR)	Spearman's rho	P-value
Correlation between K-score and A-score				
Baseline	14 (12-15)	7 (6-8)	0.300	<0.001*
1 st F/U	20 (17-24)	8 (7-9)	0.248	<0.001*
2 nd F/U	27 (23-32)	9 (8-9)	0.551	<0.001*
3 rd F/U	24 (20-32)	9 (8-9)	0.582	<0.001*
Correlation between K-score and P-score				
Baseline	14 (12-15)	6 (5-7)	0.484	<0.001*
1 st F/U	20 (17-24)	9 (7-11)	0.662	<0.001*
2 nd F/U	27 (23-32)	12 (10-15)	0.747	<0.001*
3 rd F/U	24 (20-32)	12 (9-15)	0.704	<0.001*
Correlation between A-score and P-score				
Baseline	7 (6-8)	6 (5-7)	0.294	<0.001*
1 st F/U	8 (7-9)	9 (7-11)	0.267	<0.001*
2 nd F/U	9 (8-9)	12 (10-15)	0.451	<0.001*
3 rd F/U	9 (8-9)	12 (9-15)	0.529	<0.001*

*Correlation was significant at the 0.05 level (2-tailed); P-value was calculated by Spearman correlation test

K-score and A-score, K-score and P-score, and A-score and P-score. But, the intensities of correlations were more in the case of knowledge and practice mainly due to interventions (Table 4).

DISCUSSION

The study aimed to evaluate the impact of repeated educational interventions carried out at different time intervals on mothers' knowledge, attitude and practice about diarrhea and its management. Diarrhea was slightly more common among male children compared to female. This complies with the findings of Nepal Demographic Health Survey 2006 and 2011 at the national level [3,15], but the opposite was observed in a study conducted in Lebanon [16]. The findings indicate that the gender of the children may not be an important issue regarding diarrhea occurrence. Taking the age of children into account, it was evident that diarrhea was more prevalent among children of age group 36 - 45 months. The next most prominent age group of the children was 12 - 23 months, presumably because babies of this age group are usually weaned off breast milk [3], are teething or have teethed and can move from one place to other. Diarrhea was more common among the children of younger mothers (16 - 25 years), probably due to lack of prior experience [17]. Children of the mothers who were either not educated or less educated and involved in farming suffered more from diarrhea. The finding is also supported by other studies [18,19]. This could be justified by the fact that these mothers might not be familiar with diarrhea related basic information due to lack of education and might not get enough time for caring for their children due to physically intensive farming labor work. Diarrhea was more common among the children whose fathers were factory workers and earned a median of Nepalese rupees 6000 per month.

Test-I (diarrhea at present) and test-II (diarrhea in preceding 3 - 6 months) groups were not significantly different from each

other and there were similar pattern of significant differences in knowledge, attitude and practices within the group between baseline and first follow up, and first follow up and second follow-up. However, after comparing the scores between second and third follow ups, the effect of intervention was found more pronounced in test-I group than in test-II group. This illustrates that there was comparatively more decrease in recall among the mothers of test-II (diarrhea in preceding 3 - 6 months) group than in test-I (diarrhea at present) especially at latter phases of interventions. Comparison of test and control groups in terms of effect of intervention shows that successive interventions caused significant differences in knowledge, attitude and practice scores between test-I and control-I group (i.e. diarrhea at present) as well as in test-II and control-II group (i.e. diarrhea in preceding 3 - 6 months). This declares that successive interventions were useful in augmenting knowledge, attitude and practice about diarrhea and its management regardless of whether the child was suffering from diarrhea presently or in the past.

Although there were significant correlations between K-score and A-score, K-score and P-score, and A-score and P-score even at baseline, successive interventions were able to strengthen the correlations with the highest degree of correlation between knowledge and practice. This may be due to the reason that there were not much variations among the mothers' attitudes. Furthermore, most of the mothers' attitudes were positive.

Limitations of the study

The main limitations of the study were financial constraint and adequate time. Therefore, the study did not include mothers of other different ethnicities and locations which would have required more resources as well as time. The researchers wanted to determine mothers' attitude in five Likert rating scales, but due to illiteracy among the mothers, we were not able to rate their degree of agreement or disagreement in five

scales. Thus, the scale was reduced to three scales.

CONCLUSION

The effect of sustained educational interventions was productive in significantly improving mothers' overall knowledge, attitude and practices of managing diarrhea at home in Morang district of Nepal. The study findings may be of help to government and health related non-governmental organizations working in the related field that would need to consider the study findings while making interventions at wider level.

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