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Original Article

Health Management and Policy Section

Educational Interventions and its Impact on Prevention of Diarrhoea in Urban Slums of Khordha, Odisha, India

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ABSTRACT

Introduction: Diarrhoea is a frequently found disease among children which causes childhood morbidity and mortality. Effective management of diarrhoea with Oral Rehydration Solution (ORS) immensely helps reducing the morbidity and mortality from diarrhoea among children. The preparation and administration of ORS depend on the awareness level of parents. The use of ORS can be enhanced by suitable health education and promotion among the targeted population.

Aim: To find out the knowledge among urban slum dwellers of Bhubaneswar city of Khordha district about management of diarrhoea and preparation of ORS in pre-training and post-training interventions.

Materials and Methods: A community based interventional study was conducted among 400 community members of the five urban slums of Bhubaneswar city of Khordha district from June to December 2018. There was an intervention in terms of health education and promotion among the respondents. The baseline awareness level of the participant regarding diarrhoea and preparation of ORS was assessed by pre-tested, pre-designed questionnaire. The educational interventional training was imparted to the participants. Pre and Post training measurements were done regarding the knowledge level of respondents by using the scoring method.

Results: The result shows that the knowledge regarding preventive measures and management of diarrhoea had been improved after the educational interventions. The current study found that, 194 (48.5%) of respondents were highly satisfied on the Odia skit and 82 (20.5%) shows their positive response towards demonstrations as effective methods for health education. Whereas, 52 (13%) of the respondents were satisfied with group discussion, 46 (11.5%) of respondents shows their positive response towards posters and pamphlets, and 26 (6.5%) of them positively responded towards extra-mural lectures as suitable communication methods for enhancement of knowledge.

Conclusion: Knowledge of the people regarding causes, signs, symptoms, and prevention of diarrhoea and correct method of preparation of ORS has been increased significantly after these interventions. The study shows that role play (Odiya skit) is one of the best methods which would deliver the desired messages to the community.

Keywords: Health awareness, Health communication, Health education, Health promotion, Social awareness, Urban health

INTRODUCTION

The diarrhoea is one of the preventable diseases mostly found among the children of 6 months to 2 years of age which is characterised by loose or watery stools caused by *Escherichia coli, Shigella flexneri, Salmonella typhi* and *Staphylococcus aureus* [1,2]. This is probably from food allergy, food intolerance, viral, bacterial and parasitic infection [3]. The diarrhoeal diseases are categorised into three different types like acute watery diarrhoea, persistent diarrhoea, and dysentery. The acute diarrhoeal diseases are the sudden onset of diarrhoea usually last for less than 14 days. The chronic form last longer for more than two weeks. The dysentery is an inflammatory disease of the intestine affecting the colon which is of severe form [4]. The dehydration resulting from diarrhoea causes morbidity and mortality among the children. The diarrhoea leads to severe fluid and electrolyte imbalance in the children [5,6]. At international level; diarrhoea is categorised as the second most serious causation for death among children below five years of age [7,8]. According to the report, there are 1.8 billion childhood diarrhoea cases per annum. There are more than 3 million under-five deaths due to diarrhoea of which 60-70% of deaths occur due to dehydration [9]. The World Health Organisation in a report of 2016 mentioned that in low income countries; under five deaths due to diarrhoea was 73.1 per 1000 live births which is nearly 14 times more compared to high income countries [10]. Internationally, death due to diarrhoea is high despite of declining of overall mortality rate over the last few decades [11]. In India, diarrhoea and other gastro-intestinal diseases are the major causes of death among children [12].

According to the report, globally there are 7,60,000 deaths happen due to diarrhoea of which India contributes 2,10,000 deaths [13]. Another report by National Family Health Survey confirms 13% of death among under three years of children happen due to diarrhoea [14]. Management of diarrhoea is not satisfactory especially in slum areas [15]. Most of the slum populations in India are living in undeveloped areas with lack of access to government municipal services such as piped water, wholesome water, and waste management by municipality. The slums have a greater environmental risk that leads to infectious diseases like diarrhoea [16]. The diarrhoea kills more children than any other diseases in the slums [17].

Recent advancement for management of diarrhoea with ORS containing a low concentration of salt, glucose and zinc supplementation drastically reduced child mortality [18]. The government of India promotes the use of ORS as the top most priority for reduction of diarrhoea and ensures the health of children. According to WHO in 2010, less than 60% of children received ORS and more than 40% received antibiotics during acute diarrhoea in developing countries. The breast feeding may also reduce the mortality and morbidity of children under three years of age. A recent study in Brazil shows that the infants who are not receiving breast milk are 14 times at higher risk of diarrhoeal related death than the exclusive breast fed infants [19]. Further, safe storage and handling of water are some of the important ways to prevent diarrhoea [20]. Most of the people of Odisha are familiar in terms of ORS. However, there are some knowledge gaps regarding its correct preparation and administration. Mostly the basic knowledge of the people regarding

diarrhoea depends upon various factors such as educational status, cultural practices and even managing the diseases [21]. Lack of knowledge about diarrhoea and preparation of ORS is a common problem in developing countries. It can be improved through educational intervention such as demonstration, role play (Street Theatre), and pictorial presentations [22]. In this context, the present study was conducted to find out the impact of health education in the community regarding causes, symptoms, preventive measures, and treatment modes of diarrhoea and preparation and administration of ORS through different methods in urban slums of Bhubaneswar city of Khordha district, Odisha, India.

MATERIALS AND METHODS

A community based interventional study was conducted in Khordha district. It is most urbanised among all the districts of the state of Odisha, India. Bhubaneswar city is one of the blocks of this district which was chosen for the study of diarrhoea intervention. According to census 2011, the total population of this city is 929,717. The literacy rate is 91.73% of which male literacy is 94.58% and female literacy is 88.53% [23]. There are 436 slums found in the city of Bhubaneswar with slum population of 301,611 persons located on unutilised government land, railway stations, and below the flyover bridge [24,25]. The slum dwellers are mostly daily labors, farm workers, construction workers, and small-scale businessman. The people of slums are very poor; also the people cannot afford to construct the sanitary latrines. About 80% of slum dwellers in Bhubaneswar practice open defecation. Many times they are prone to all types of natural hazards, environmental problems, including health risks. The sample of the study has been calculated with the help of the formula $N=Z^2\times(P)\times(1-P)/C^2$ (N=sample size, Z=Value corresponding to a given confidence level, P=percentage of the primary indicators in decimal, C=Standard error, expressed as decimal) used in most of the descriptive study by the social researcher [26]. For the present study, 47% anticipated frequency, 80% power, 95% confidence interval, 5% absolute precision, design effect 1 are taken for the calculation of sample size. Estimated sample size is 383 and collected sample size is 400. For this study, simple random sampling was done from the general population of 5 urban slums (Chillipokhari Basti, Gourinagar Basti, Garage chack kenal Basti, Kancha sahi and Dhoba sahi, and Kela Basti) of Bhubaneswar city of Khordha district. The study participants were men and women from the general population of these five slums aged more than 16 years old. The nature and purpose of the study was explained to them and their questions regarding the study were answered. The study was conducted with no harm to any living or human subject. The study adopted educational methods as intervention of health education which is of health communication in nature. The informed consents were collected from the respondents as part of the standard research process. For official purpose, grant number may be treated as 1.

Pre-test primary data was collected from the personal interview of 400 participants among the 5 urban slums of Bhubaneswar and the post-test data collected after the educational interventions in the same community during the period of June 2018 to December 2018. Educational interventions consist of different methods like: extramural lectures, group discussion, poster and pamphlet presentation, demonstration, and role play method. In extramural lecture method, the lectures had been given in Odia language by the investigator which was very much communicable to the target audiences which mainly involves about diarrhoea, its causes, prevention, and dietary management. Apart from these points, it also covers sanitation, child health care, food habits during different seasons, cleanliness of surroundings, purification of drinking water, storage of water, and uses. In Group discussion method, matters like dehydration due to diarrhoea was discussed. The conversation of the group discussion was in Odia language. It was based on the following points like: susceptible causes, seriousness and prevention of diarrhoea, why it is common in poor economic group. Apart from these, it also covers procedure for purification of drinking water, personal hygiene and breast feeding practices.

The posters and pamphlets were exhibited in the target locality to create awareness among the target group which mainly contain the posters like: take safe water and prevent diarrhoea, keep your hands and foods clean before eating, diarrhoea is dangerous for infants and young children, avoid the house-fly in your house and eradicate diarrhoea, don't takes stale food for preventing diarrhoea, dehydration takes the life of an individual, keep clean surrounding of your house, take house prepared ORS and prevent dehydration, take the advice of doctor for the eradication of dehydration due to diarrhoea, take ORS and check diarrhoea, sign of dehydration, do not stop breast feeding during diarrhoea. All these pictorial depictions are taken from the relevant sources which are usually used by government programs by ministry of health and family welfare. Demonstration method used to show the actual practices of preparation and prevention of diarrhoea.

Method of preparation of ORS was demonstrated by the investigator, health worker and Anganwardi worker to the target audience. These methods include the following aspects for creation of awareness. This is also a method used for appropriate demonstration in government programs by ministry of health and family welfare. Role-Play method was used for better understanding of the activity in a one act play. An Oriya skit named as "TARALA JHADA BYE-BYE" (meaning good bye to loose motion) was performed for three times in different places of the target locality. The story, dialogue, screen-play was written by the investigator. The play direction was also given by the investigator. The pre-survey report clearly indicated about the blind believes of the target group regarding diarrhoea. In order to eradicate these blind beliefs, the Oriya skit was organised by the investigator. The duration of the skit was 15 minutes.

Study Tools

The work plan was implemented in three phases. In phase one, a baseline data was collected for three months (June, July and August) to assess the knowledge about prevention and management of diarrhoea at home. The questionnaire was designed by the researcher by thoroughly studying the relevant authoritative scientific articles [1,7,26]. The questionnaire was already validated and reliable according to some study and also used as standard tool [26]. This composed of two parts: socio-demographic determinants and the pre-test section dedicated to assess knowledge about prevention and management of diarrhoea. There were total 30 questions including socio-demographic characteristics. In phase two health and nutrition education on the prevention and management of diarrhoea was formulated and education based on the definition, aetiology, assessment of complications, prevention and management of diarrhoea. Apart from these points it also covers the topics like sanitation, child health care, food habits during different seasons, cleanliness of surroundings, purification of drinking water, its storage and use etc. The educational methods were lectures, group discussions, posters and pamphlets, demonstrations and role plays. The participants were divided into 10 groups, two groups in each slum, with almost 40-45 participants in each group. The researcher and the community health worker take care of supervision. The third phase, collect post-test data by applying post-intervention questionnaire with the specific scoring methods like highly satisfaction (The respondents said I learn so many things about diarrhoea is scored as 1), partially satisfaction (The respondents said I learn something about the prevention or management of diarrhoea is scored as 2) and not satisfied (The respondents said only diarrhoea is a disease is scored as 3) after the training sessions with an objective to evaluate the awareness program regarding the prevention and management through different methods [26].

STATISTICAL ANALYSIS

Statistical analysis has been done using SPSS (Statistical Package for Social Science IBM version 21) software. In table, the total value of the sample is marked as n (n=400). Mean, percentage was calculated to know the socio-demographic and the pre-test and post-test knowledge regarding the prevention and dehydration due to diarrhoea. Data tabulation, figures and analysis are documented using MS-office software.

RESULTS

It has been found that among the 400 participants in the study, majority 159 (39.8%) were under 26-35 years of age group, 98 (24.5%) were under 36-45 years of age group, 81 (20.3%) were more than 45 years of age group, 50 (12.5%) were under 18-25 years of age groups and 12 (3.0%) is less than 18 years of age groups. The details of demographic characteristics are shown in [Table/Fig-1].

Sl No.	Variables	Category	Frequency (n=400)	Percentage (%)
1	Gender	Male	90	22.5
		Female	310	77.5
2	Age	<18 years	12	3.0
		18-25 years	50	12.5
		26-35 years	159	39.8
		36-45 years	98	24.5
		More than 45 years	81	20.3
3	Education	No formal education	186	46.5
		Primary school	139	34.8
		Secondary school	55	13.8
		College and above	20	5.0
4	Occupation	Agriculture labour	32	8.0
		Seasonal labour	294	73.5
		Job holder	13	3.3
		Other	61	15.3
5	Hospital availability	PHC	152	38.0
		CHC and headquarter	248	62.0
6	Sources of drinking water	Piped line	248	62.0
		Tube well	152	38.0
7	Purification process of water	Don't purify	368	92.0
		Filter	21	5.3
		Aqua guard	11	2.8
8	Times of food intake	Less than 2 times	2	0.5
		2-3 times	279	69.8
		3-4 times	70	17.5
		More than 4 times	49	12.3
9	Quality of food	Fresh food	283	70.8
		Previous day food	117	29.2

[Table/Fig-1]: Socio-demographic determinants.

The pre-survey report indicated that among 400 participants 244 (61%) had little knowledge about diarrhoea. On the other hand, 51 (12.8%) had little knowledge about dehydration while 349 (87.3%) had no knowledge regarding dehydration, only 29 (7.3%) knew about the signs and symptoms of dehydration. The details of the factors of pre-test report are shown in [Table/Fig-2].

After the intervention, it was found that 194 (48.5%) respondents were highly satisfied towards the skit as it was more attractive and amusable. About 82 (20.5%) respondents showed their positive response towards the demonstration method, 52 (13%) of respondents were satisfied with group discussions, 46 (11.5%) of respondents showed their positive response towards posters and pamphlets, and 26 (6.5%) of respondents positively answered towards extra-mural lectures. Baseline knowledge of the targeted

Sl No.	Variables	Category	Frequency (n=400)	Percentage (%)
1	Knowledge on diarrhoea	Yes	244	61
		No	156	39
2	Food intake during diarrhoea	Yes	102	25.5
		No	295	73.8
		Don't know	3	0.8
3	Idea about dehydration	Yes	51	12.8
		No	349	87.3
4	Consequences of dehydration	Yes	29	7.3
		No	371	92.8
5	Methods to check dehydration	Medication	293	73.3
		Saline	29	7.3
		Both saline and medication	10	2.3
		Don't know	68	17.0
6	Knowledge about ORS	Yes	288	72
		No	112	28
7	Fruitfully of ORS	Yes	290	72.5
		No	39	9.8
		Don't know	71	17.8
8	Knowledge about preparation and uses of ORS	Yes	290	72.5
		No	110	27.6
9	Proportion of ORS and Water	One pack in measured volume of water	79	19.8
		Some water and some powder	209	50.25
		Don't know	112	28
10	Dosages of ORS	Slowly at small interval	203	50.8
		On demand	81	20.3
		Don't know	116	29
11	Breast feeding practises during diarrhoea	Yes	281	70.5
		No	46	11.5
		Don't know	73	18

[Table/Fig-2]: Pre-test assessment of knowledge on diarrhoea and dehydration.

people regarding breast feeding practices during diarrhoea was 11.8% which was significantly increased to 88.3% after the interventions. The details of the factors of post-test report are shown in [Table/Fig-3].

DISCUSSION

The present study was about the impact of educational interventions regarding prevention of dehydration was analysed from 400 respondents of urban slums of Bhubaneswar city. Usually socio-demographic factors play an important role in the health promotion on the prevention of diarrhoea. The factors like age, education, occupation, family income, cultural practices influence the awareness regarding management of diarrhoea. Further, these factors stimulate the personal attitude and behaviour of the person. It has been found that despite the awareness of diarrhoea, good result are not established. In this study, majority of the targeted respondents were below poverty line. Majority of them 46.5% are uneducated or have low level of educational achievement. Around three-fourth of them (73.5%) were seasonal labours, auto driver and beetle shopkeepers. Most of them were taking stale food and dirty drinking water. The surrounding of their houses had not been cleaned properly. They had no knowledge about sanitation and personal hygiene. So, the study used methods like skit play, demonstration and role play to reach the underprivileged population.

Evidence in Northeast Ethiopia shows that the educational attainment of mothers and socio-economic status of households are

Sl No.	Variables	Methods of assessments	Satisfaction with different methods	Frequency (n=400)	Percentage (%)
1	Improved knowledge regarding the causes and prevention of infantile diarrhoea through different methods	Oriya skit	Highly satisfied	194	48.5
			Partially satisfied	188	47
			Not satisfied	18	4.5
		Demonstration	Highly satisfied	82	20.5
			Not satisfied	318	79.5
		Group discussions	Highly satisfied	52	13
			Partially satisfied	250	62.5
			Not satisfied	98	24.5
		Posters and pamphlets	Highly satisfied	46	11.5
			Partially satisfied	205	51.3
			Not satisfied	149	37.3
		Extramural lectures	Highly satisfied	26	6.5
			Partially satisfied	149	37.3
			Not satisfied	225	56.3
2	Purify drinking water	Yes		357	89.3
		No		43	10.8
3	Prohibit breast feeding during diarrhoea	Yes		47	11.8
		No		353	88.3
4	Stale foods intake during diarrhoea	Yes		400	100
		No		0	0
5	Maintain hygiene	Yes		400	100
		No		0	0

[Table/Fig-3]: Post-test assessments after the educational interventions.

expressively correlated with childhood diarrhoea. The prevalence of diarrhoea was 2.5 times higher among the children of women having no formal educations, and prevalence of diarrhoea was 1.6 times higher among the children in families with poor socio-economic background [27]. Another similar study conducted in 2017 shows the occurrence of diarrhoea was higher among the rural children with poorest wealth index quintile compared to the children of the richest. The number of diarrhoea cases was highest among the children with low level of maternal education [28]. Evidence in Thailand shows prevalence of diarrhoea was highest with one child among under five years of age [29]. These studies also found many socio-demographic features having strong bearing on the health seeking behaviour. The health communication needs to be effective in reaching out the people having in a disadvantaged condition. So drama, skits demonstrations really help in achieving the goals of improving communicable diseases like diarrhoea.

A study conducted in Southern Ethiopia shows an increasing incidence of diarrhoea was strongly related with lack of drinking water purification, unsafe fecal disposition of infants and lack of latrine ownership [30]. Another study conducted in Mbour, emphasised that the prevalence rate of under-five diarrhoea was in the central (36.3%) and peri-central areas (44.8%) of Mbour. Also, the prevalence of diarrhoea was strongly associated with the mother's occupation i.e., housewives were associated with higher incidence compared to those of working women [31]. A similar study conducted in 2016 shows that, out of 200 participants' only half use proper hand washing techniques with soap before and after eating which is good for the health of children [16]. The current study shows during the pre-survey out of 400 participants 244 (61%) had little knowledge about diarrhoea while 156 (39%) of had no knowledge related to diarrhoea. Most of the target people have no clear idea about dehydration, its occurrence, symptoms, and its seriousness. They did not know that ORS would have easily prepared by themselves and ORS is most effective to check dehydration. Respondents having little knowledge about ORS could not prepare the solution due to ignorance of approximate proportion of common salt, sugar, and water for the solution. In addition to this, the use of ORS was completely unknown to some of them. During the occurrence of diarrhoea, majority (70.5%) of mother stopped breast feeding to the infants. They have a negative perception about unsafe nature of mother's milk during diarrhoea. The issues of infrastructure and urban amenities would take long time to rectify in the urban slums. However, the health communication by various ways can be done with much less investment in the health system. So, the studies suggest, intervening effective health communication measures in preparation and making the parents aware about diarrhoea.

A study conducted in Delhi in 2014 showed that majority (80%) of diarrhoea occurs due to infected food and drinking water. Around 83% of mothers have knowledge about the prevention of diarrhoea by using purified drinking water. However, only 36% practiced this in taking care of the children. Around 90% of mothers believed that hand washing with soap after defecation prevents diarrhoea, whereas 88% were practicing this. Three-fourth of mothers use ORS during diarrhoea, but only 26% considered that the ORS is necessary for the treatment of diarrhoea [32]. Another study conducted in Karachi in 2014 have shown similar result where 80% of mothers had awareness about the making of ORS for the management of diarrhoea, 15.5% mothers had knowledge regarding the use of safe food, and 14.5% had knowledge regarding the uses of safe water during diarrhoea [33]. Another study conducted in Iran in 2013 emphasised that 63.4% of mothers had knowledge about diarrhoea, whereas only 3.7% had good knowledge regarding diet and 56% respondents moderately practice [34]. A study shows that diarrhoea is more common in low socioeconomic and lower education groups. About half of the respondents had knowledge about diarrhoea, 34% of mothers were aware of the danger signs and dehydration and 27% of mothers know about the treatment of dehydration [26]. Another study shows that the mothers had little knowledge regarding the prevention of diarrhoea and the administration of fluid and food. However, none of the mothers had knowledge regarding the signs of dehydration and correct method of preparation of ORS. Only 8.5% of the mothers know the purpose of administration of ORS [21]. Evidences show that among all the study participants only 19.32% of respondents had knowledge regarding diarrhoea [22]. Similarly, another study shows that 46% of mothers use ORS for the diarrhoeal treatment and 38.7% had the

knowledge regarding the correct method of preparation and 41.6% had the knowledge regarding exact quantity provision of ORS [9]. A study shows that out of 100 mothers, 93% had knowledge about ORS and 75% women had adequate awareness regarding preparation and administration of ORS [11]. All the studies focus on socio-ethnic concerns for the improvement of knowledge of parent for the treatment and management of diarrhoea. So, there is need of lucid health communication to improve the health conditions.

In the current study, post-survey report indicates that 194 (48.5%) respondents said the skit delivered the desired messages. They were highly satisfied with the skit as the skit was more attractive and amusable. The skit was the effective measure for eradication of blind believes regarding diarrhoea from the mind of the target group and developed confidence among the target people. They came to know diarrhoea is a disease and it should be cured by proper treatment. About 82 (20.5%) showed their positive response towards the demonstration method which is the second method among the tools and techniques developed for the present study. Overall the effectiveness of communication depends on many socio-economic factors. However, appropriate procedures have to be adopted for understanding of the issues of diarrhoea and provide solutions thereof. A similar study conducted in Al-Darb Al-Ahamar (ADAA) district of Cairo, Egypt shows the knowledge and attitude of the locality can be enhanced by intervention of skits which usually raise the public awareness regarding diarrhoea, malnutrition, and anaemia [35].

LIMITATION AND STRENGTH

The study had a wide range of participants in age; it had a good sample size and an overall good response rate. The awareness of the people regarding prevention and management of diarrhoea enhanced. However, this achievement in awareness has suspicious result for the improvement in health. Therefore, the future study may take community participation into consideration for better result. Another limitation of the study is self-reporting instruments in the practice of food habits, personal hygiene, sanitation, particularly when the subject matter is of a personal view then the person may act good or bad according to the situation.

CONCLUSION

The study show that improvement in the knowledge of the people on key factors like causes, signs, and symptoms and prevention of diarrhoea help them in fighting diarrhoea. The intervention in the method of preparation of ORS helps them significantly by health education. In the present context, throughout various educational interventions role play (Odia skit) is the most appropriate method. This clarify that health education in community needs to be intensified. So, the study strongly recommends that efforts through drama on various aspects of healthcare must be organised to provide a strong message in the community. The street theatre has a strong bearing on the creation of health seeking behaviour regarding the communicable disease among the slum population. The government must adopt all such methods to educate people to fight other communicable diseases and life style diseases.

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