Gastroenteritis: A Grass Root Approach

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ABSTRACT.   A Pilot Project was conducted in a "Katchi-Abadi" (squatter-settlement) of Karachi, Pakistan, using minimum resources and funds. It was attempted to reduce the morbidity and mortality due to gastro-enteritis by health education, regarding the role of sanitation and breast-feeding in the prevention of gastro-enteritis and propagating the use of ORS for its management. Only four resource personnel were used to propagate information to one hundred households. A base-line survey indicated that the incidence of diarrhoea was highest in children between 6 months to 1 year old (42.9%). Gastroenteritis accounted for 25% of all deaths in children up to 5 years. A "post-intervention" survey carried out after imparting health education revealed a significant difference in the incidence of gastroenteritis between the intervention and "control" groups. Other variables considered including literacy and family size did not influence the incidence of diarrhoea. Similar results were seen when a significant difference of $p < .05$ was found between the "intervention" and "control" groups regarding the proper management of acute diarrhoea i.e. proper use of ORS. Thus our pilot project succeeded in altering the awareness and practices of the community regarding both prevention and management of Acute Gastroenteritis.

Introduction

Diarrhoeal diseases constitute a significant social, economic and medical challenge to mankind. While in developed countries with improved socio-economic conditions and environmental sanitation the incidence has declined in the last 50–60 years, in developing countries, diarrhoeal diseases remain a problem. Acute diarrhoea affects nearly 500 million children annually, and is the leading cause of morbidity and mortality in children under five years of age, with a mortality of 3.5 million annually. Pakistan ranks highly among the developing countries of the world with a IMR (Infant Mortality Rate) of 106. About 70% of children under five years suffer from severe malnutrition with only 55% of the total population having access to health services. Morbidity due to diarrhoea is 52/1,000 in children under 5 years of age. Predisposing factors for this high incidence of diarrhoea include unprotected water supply, poor environmental sanitation, unsafe sewerage

disposal, increasing incidence of bottle feeding, contamination of home-made weaning foods and poor nutrition.

Walsh and Warren identified diarrhoeal diseases as a priority target for selective Primary Health Care. They emphasized oral rehydration as the key intervention for reduction of diarrhoeal diseases mortality. But, to reduce both morbidity and mortality due to diarrhoea, a multifaceted approach is essential.

A pilot project was initiated in a "Katchi Abadi" (squatter-settlement) of Karachi, with the aim of reducing the incidence of gastroenteritis and mortality resulting from it. This "Katchi Abadi" is located in Karachi, Pakistan and comprises a population of 60,000. The majority of the people belong to the province of Sindh and Baluchistan and are chiefly labourers by profession. It is basically a low socio-economic area with an average income of Rs.500–2,000/month ($102 per capita). The women are chiefly uneducated and rarely venture outside their houses. "Quacks" impersonating doctors provide curative health services. The methodology involved was increasing awareness of people regarding the role of improved sanitation in preventing diarrhoea and propagating the use of ORS[1] in its management. Communication techniques used were group discussions about pertinent health-related behaviour, aided by visual aids e.g. flip charts and pamphlets. The efficacy of these health messages in fulfilling the objective was then evaluated.

Materials and methods

The area in which the Pilot Project was initiated was a squatter-settlement of Karachi, Pakistan. A base-line survey of the area was initially done and simultaneously data regarding the incidence and mode of treatment of diarrhoea was collected. Health Education was then imparted to Primary Health Care Workers (PHC) from this area. Educated females (up to high-school education) from the community were chosen to be trained as Primary Health Care workers. Four voluntary doctors from an NGO (Non-Governmental Organization) working on the Project were the Resource Personnel for the training. These resource personnel trained 10 PHC workers who were then required to transfer information to 100 households. The training comprised of different sessions in which resource personnel gave background knowledge with the help of audio-visual aids and demonstrations. PHC workers were then required to demonstrate the mode of teaching they would use to instruct mothers. Initially 10 PHC workers were trained. Each PHC worker therefore imparted health messages to women in ten households.

4 Resource Personnel → 10 PHC Workers
10 PHC Workers → 10 × 10 Households

1. Oral Rehydration Salt.
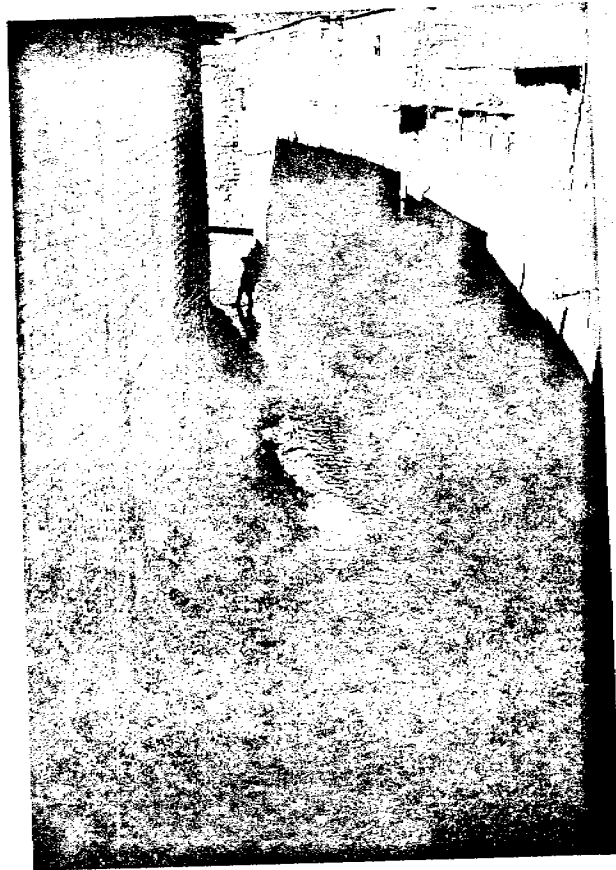
Child scavengers in open sewer, Quetta.
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The health education element comprised messages related to the promotion of breast-feeding, adequate weaning, sanitation and personal hygiene and its importance in prevention of diarrhoea, and early use of oral rehydration therapy, for children suffering from diarrhoea. After an interval of six months (which was thought to be adequate to measure changes in knowledge as well as practice), another survey was done to evaluate the effectiveness of the health education imparted. The second survey was done on the intervention group (those given health education) as well as a control group with a total sample size of 200 households equally distributed between two groups. Parameters measured in the survey included a change in the incidence of gastroenteritis and questions on knowledge and practice of correct management (use of ORS) during an episode of acute gastroenteritis. Data was collected by means of a questionnaire filled by medical students specifically trained for this purpose. Acute gastroenteritis was defined as frequent passage of watery stools. This was used synonymously with diarrhoea. Data was analysed on an IBM Computer 4331 using the Application System (AS). Statistical tests used were Chi-square, Pearson's R and F-Test.

Results

Results are based on a total of 200 households. The base-line survey revealed that the community had a low socio-economic population with an average per capita Income of Rs.200 (US$10)/month. Adult literacy was 37.4%. Female literacy was even lower at 24.8%. Forty one percent of households used a community tap for their water supply. However, 60% of them had to store water because of inadequate supply. Among those who stored water, it remained uncovered in 13% households. Between 20–26% of households did not have adequate water for hand washing, cooking or cleaning. Seventy two percent used a conservancy system for excreta disposal. Fifteen percent disposed of their garbage by an unconventional method (burnt, dumped in river) (Table 1). The age distribution graph indicated that the majority of the children (60%) were between 1–4 years. Children comprised 1/4 of the total population with an average of three children per household. The incidence of gastroenteritis was highest in children between six months to one year (42.9%). Of all causes of death, gastroenteritis accounted for 25%, in children up to five years of age. Among children who died due to gastroenteritis, 59% were under 1 year of age, and 95% were between 0–5 years of age. Among the other causes of death were Acute Respiratory Infections and communicable diseases.

We then tried to evaluate the health practices of mothers during an episode of acute gastroenteritis. About 46.5% of mothers stopped breast-feeding and 33% stopped all types of feeding. Among households interviewed, 28% did not use ORS in an episode of gastroenteritis and only 30% of mothers

Table I Base line data

	% of households
1. SOURCE OF WATER	
(a) Tap inside the house	59
(b) Community tap	41
2. WATER STORAGE	
(a) Covered	87
(b) Uncovered	13
3. EXCRETA DISPOSAL	
(a) Flush system	28
(b) Conservancy system	72
4. METHOD OF GARBAGE DISPOSAL	
(a) KMC (Municipal Corp.)	85
(b) Others (river, burnt)	15

n = 200 households

used a sugar salt solution (SSS). Next we tried to gauge knowledge and practice regarding personal hygiene. A sizeable number, i.e. 96%, were aware of hazards associated with flies. However, only 23% boiled drinking water.

In the post-intervention survey, independent variables used included our "intervention", literacy, total income and family size. Incidence of gastroenteritis differed significantly between "intervention" and "control" groups. However, no correlation was seen between level of literacy, family size and the incidence of gastroenteritis (Table 2).

Regarding proper case-management of acute diarrhoea, i.e. proper use of ORS, results indicated that a significant difference of $P < 0.05$ existed between "intervention" and "control" groups. A correlation was also seen between literacy and use of ORS. However, no difference was documented statistically when income and family size were considered (Table 3).

When changes in hygienic health practices were studied (Table 4) and it was found that our "intervention", in which emphasis was laid on hygienic health practices, e.g. keeping food covered to protect against flies, did influence food storage pattern (covered and uncovered) and garbage storage. However, it did not influence the boiling of water.

Table 2 Incidence of gastroenteritis

1. Intervention	No. of cases	
Yes	22	
No	71	$P < 0.05$
2. Family size		
2–5 individuals	22	95% confidence
6–10	38	level = 0.145
11–15	36	Pearson's R = 0.136
16–50	50	

(Family size includes members of extended families)

3. Literacy	Households with Gastroenteritis	No. of episodes of Gastroenteritis	
Illiterate	8	12	
Read and write	9	11	95% confidence
Primary	31	46	level = 0.145
Secondary	16	23	Pearson's R = 0.018
Higher	1	1	

n = 1,551 individuals.

Table 3 Effects of independent variables on the proper case management in acute diarrhoea

INDEPENDENT VARIABLES	
Intervention	$P < 0.05$
Literacy	Pearson's R = 0.162
Family size	Pearson's R = 0.122
Total income	Pearson's R = 0.001
	95% confidence level: 0.145

Table 4 Effects of intervention on hygienic health practices

INTERVENTION	F-Value	F-Point
Food storage	8.836	99.6
Boil water	0.693	59.3
Garbage storage	6.084	98.5

Discussion

Communication with an illiterate community with few resources and exposure to newspapers, radio and television is difficult. It is even more difficult to document objective changes obtained by the communication techniques used. In this Pilot Project we were able to demonstrate statistical improvement in knowledge and practices related to gastroenteritis.

Faecham et al have proposed a model whereby potential interventions to reduce morbidity or mortality due to diarrhoea amongst children under 5 years, should aim towards four objectives: (1) Oral rehydration therapy and appropriate feeding during diarrhoea whereby nutritional intake of the child is not reduced; (2) increasing host resistance to infection by improving child nutrition; (3) reducing transmission of pathogenic agents of diarrhoeal diseases through improved water supply, excreta disposal, personal and domestic hygiene; (4) controlling diarrhoea epidemics. Our Pilot Project concentrated on (1) and (3) whereby both morbidity was reduced and diarrhoea management improved.

Faecham et al in their review of several studies indicates that improving personal hygiene is more instrumental in reducing morbidity due to diarrhoea than changing water supply or sanitation systems. The specific behaviours which promote transmission of enteric pathogens is water-handling behaviour, food handling behaviour and hand-washing. Torun conducted a similar Programme in Guatemala during 1979–80 whereby mothers were given education about hygienic health practices, food-handling, hand-washing etc. He reported increased awareness in 88% of households six weeks after the Programme, as compared to 56% prior to it. In yet another study Ersey et al have shown the efficacy in reduction of morbidity and mortality rates of diarrhoea by improving water-supply and hygiene.

Oral rehydration therapy is effective in reducing mortality due to gastroenteritis, as seen in studies from Phillipines, Bangladesh and Egypt. These have all demonstrated a decline in diarrhoeal mortality by 50–70%. It is said that the estimated cost of treating a case of gastroenteritis with ORS is US$1 and the cost of hospital treatment of gastroenteritis is US$200–300. As mentioned earlier, encouraging and propagating the use of ORS was one of our main objectives. As shown by our results, we succeeded in increasing the awareness of the intervention group in this regard, through health messages.

In spite of careful planning, there are some potential biases in our study. In our follow-up survey, the same member of the household was often not available to answer our further queries. Interpretation of some of these results was also very difficult e.g. covering of food, hand washing, since these should be observed. Other biases may be due to the time interval between pre- and post-intervention surveys. Interviewers also changed as a different group of medical students were involved each time. Notwithstanding the above difficulties we feel that our project was in itself very cost-effective in that it utilised a minimum number (four) resource personnel to reach one hundred households. Through simple measures, not only awareness in the community improved but also the incidence of gastro-enteritis decreased: this reflects that both attitude and practices were affected. Except for our "intervention" and, to a certain extent, literacy, no other independent variable had any influence on the incidence of gastroenteritis and knowledge of its management. Utilization of workers from the community, and improved community participation was conductive'in obtaining our objectives. We feel that this Pilot Project can be replicated in other communities, which will help in the prevention and improved management of diarrhoea at grass-root level, with minimum resources.

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