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Health education as a strategy for improving the management of diarrhoea

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The Diarrhoeal Disease Control Programme of the World Health Organization (WHO) has advocated a four-point strategy for decreasing the mortality and morbidity associated with diarrhoeal diseases through mutually reinforcing and complementary measures². First, the plan calls for better management of episodes of diarrhoea and emphasizes the use of oral rehydration therapy and the appropriate feeding of children during diarrhoeal illness and convalescence⁴.

The second strategy seeks to increase host resistance to infection through a variety of measures such as improved maternal and child nutritional status, appropriate infant-feeding practices including breast-feeding, and adequate coverage of immunization, particularly against measles. Improved child nutrition is viewed, therefore, as a key mechanism for enhancing immunocompetence. The third and fourth strategies are to reduce the transmission of the pathogenic agents of diarrhoeal disease and to control and/or prevent diarrhoea epidemics. Improvements in the standard of living, particularly in water supplies and waste disposal and better hygienic practices, are essential for interrupting the transmission of diarrhoeal disease pathogens. Unfortunately, the intractable problem of poverty and the staggering cost of even very simple water supply and sewage systems makes effective environmental sanitation a long-term prospect for most people in all but a few countries. Prospects for health education seem more hopeful and it has been proposed that in spite of the poverty of developing countries, the level of health could be significantly improved through the adoption of more appropriate health practices¹.

Until recently, the history of health and nutrition education was disappointing³. Little was achieved by programmes which focused on knowledge acquisition and on such irrelevant concepts as the four food groups. Recent attempts to apply 'social marketing', which uses the techniques of commercial advertising and product design strategies, have been more successful. The objectives of this paper are to describe one such project which took place in Honduras and to present some key findings.

The Honduras mass media and health practices project. The project was an undertaking of the Honduran Ministry of Public Health and was implemented by the Academy for Educational Development based in Washington DC. Our group at Stanford University was in charge of the evaluation. The programme used a combination of radio, printed material, and interpersonal communication through health workers to teach mothers to prevent and treat acute diarrhoea. The programme focused on the promotion of a prepackaged oral rehydration solution (ORS) that mothers could mix and administer at home when their children were ill. Supplementing messages about ORS administration were messages on prevention behaviours such as continued breastfeeding, feeding during diarrhoea, basic hygiene, and appropriate food preparation for children. The prepackaged salts for the mixture were produced in Honduras using the WHO formula. The package of salts was mixed with a litre of water, and hence received the name 'Litrosol'.

The intervention was distinguished by several features. The steps that must be taken and the resources that are required before an action in health behaviour is carried in the local setting were identified and taken into account in the design of the campaign. Local vocabulary and beliefs were incorporated into campaign messages and these focused on a carefully specified set of feasible objectives and stressed a few key behaviours rather than general knowledge acquisition. Other aspects were pretesting of as many messages, materials, and procedures as possible and careful monitoring and modification of the campaign as it progressed. Over the course of two years, the programme took advantage of an extensive network of private and public radio stations to transmit thousands of radio spot announcements and dozens of weekly health programmes which repeated Litrosol mixing instructions and reminded mothers when to seek care at health centres. A variety of posters, instructional pamphlets, and photonovelas were developed for both health workers and rural mothers. Hundreds of health workers were trained by the project on how to teach mothers to use Litrosol properly.

Evaluation design. The programme was targeted to a region containing approximately half a million people. To measure the effects of the intervention, a panel of 750 families with young children were studied for 2 years. Families were recruited into the study from 20 communities under a stratified sampling plan with random selection within communities.

A model was developed to help guide the evaluation. In order for any changes in behaviour or in health status to take place, a complex sequence of events had to occur (Fig. 1). For a successful campaign, the target audience needs to be exposed to the campaign effort. Next, it is required that the audience learn from that exposure and that messages be remembered and accepted in order for behavioural change to occur and for this change to result in improved health status.

Evaluation findings. In general, the population had good access to radio, interpersonal contact through the health care system, and printed materials, as well as high exposure to the campaign components. For example, 80 per cent of the families owned at least one radio. After asking them to turn the radios on to demonstrate that they worked, 67 per cent of the families had working radios. Radio had a very high penetration in rural areas and was listened to very frequently. An average of 60 per cent of mothers reported listening to the radio on the previous day.

Exposure to campaign message through the different channels is the second step of the evaluation model. Radio coverage with campaign messages was extremely high and 73 per cent of women listeners remembered hearing at least one radio spot the previous day. Listeners reported hearing an average of 3.3 spots.

A great deal of learning of the specific content of the campaign messages took place as exemplified by knowledge about Litrosol and breast-feeding (Fig. 2). In assessing these changes, three types of samples were studied. There was concern that repeated visits to households might

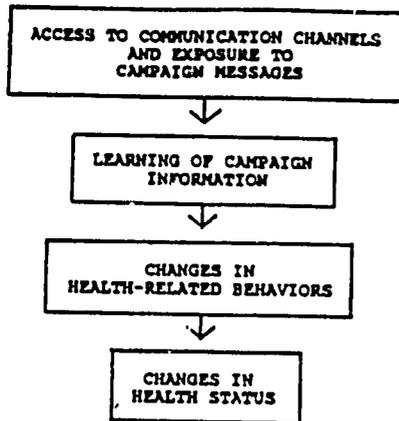


Fig. 1. Simplified version of process model used in Honduras evaluation.

cause mothers to become more aware of the campaign. For this reason, in the case of measures of learning and exposure, the experimental sample was randomly divided into two equal groups. The first group was visited four times and is called the 'High-frequency interview' group. The second group was not questioned about media aspects until the end of the intervention and is referred to as the 'Low-frequency interview' group. Also, a sample outside the study area was included as a further check. This last group came from villages that received all the elements of the campaign but which were not visited by the field team till the end of the campaign. This group is called the 'sample outside study area'.

The name 'Litrosol', was introduced with the campaign and within 6 months after broadcasts began, half of the mothers could name Litrosol as the medicine being promoted, a figure which rose to nearly 80 per cent almost two years later. Values for the two other samples, the low-frequency interview group and the outside study area group, are around 10 percentage points lower suggesting a small effect of repeated visits.

The campaign also emphasized the benefits of breast-feeding. Figure 2 shows the percentage of correct responses about the benefits of breast-milk as a percentage of all possible responses. Examples of correct answers are its lack of contamination and its anti-infective properties. There was a clear rise in knowledge in the high-frequency interview group. Between the third and fourth surveys the breast-feeding messages were intense and a clear rise occurs. Knowledge in the two control samples was only slightly lower suggesting a true campaign effect. These data are misleading in that they suggest mothers knew very little about the benefits of breast-milk. This is unlikely. Rather, the campaign may have taught mothers how to express the benefits of breast-feeding in concrete terms and more importantly it may have generated more positive attitudes towards breast-feeding among rural women.

Through a morbidity questionnaire, the percentage of episodes which were treated with Litrosol in the 2 weeks previous to the interview were monitored. These data were collected through five surveys. A few months into the campaign, 10 per cent of cases were being treated with Litrosol, a figure which rose to 37 per cent in the final survey. Younger children were more likely to be treated than older ones and boys were just as likely to be treated as girls. The probability of Litrosol use rose with the seriousness of the episode, either as perceived by the mother or as defined by signs of severity and dehydration.

Feeding behaviours, particularly breast-feeding and feeding during episodes of diarrhoea, were also targets of the campaign. Breast-feeding appears to have been increased by the campaign: early in the intervention, 65 per cent of children under 18 months were breast-feeding; by the end of the campaign, the number had risen to 81 per cent of children under 18 months ($P < 0.005$). Similarly, bottle-feeding dropped from 64 per cent to 50 per cent over the same time period ($P = < 0.005$). Continuation of breast-feeding and bottle-feeding during episodes of diarrhoea was at about the same level. That is, virtually all mothers who were breast-feeding or bottle-feeding reported that they continued to do so during episodes of diarrhoea. There was a slight rise in the giving of other liquids during episodes.

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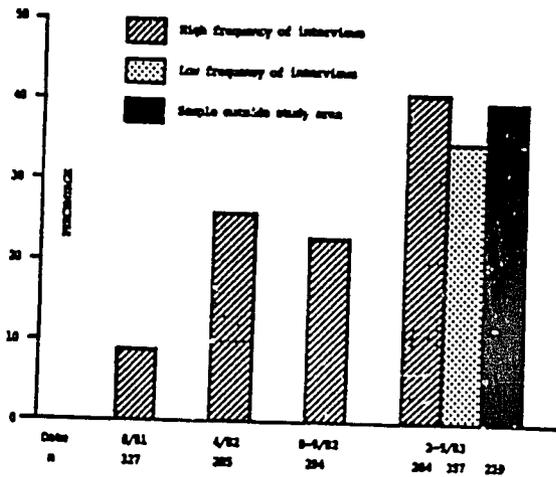


Fig. 2. Correct responses about the benefits of breast-milk as a percentage of all possible responses.

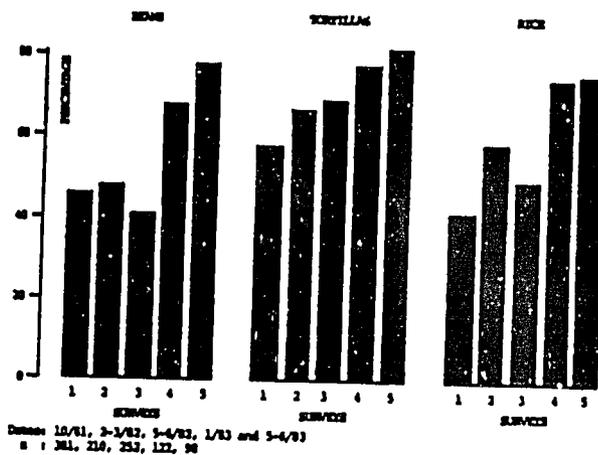


Fig. 3. Percentage of children consuming staple foods during episodes of diarrhoea within the last 2 weeks.

There appears to have been an increase in food consumption during episodes of diarrhoea as shown in Fig. 3. This is suggested by three simple indicators of food consumption; namely, the percentage of children who consumed beans, tortillas, and rice. These foods are the three principal staples and together usually account for most of the food intake. There is a clear overall tendency towards greater food consumption during diarrhoea over the course of the study period and this tendency is evident for all three staples.

Data from the official death registry was used to assess mortality changes. Data for all deaths in children less than 5 years in the three county seats where the study villages are located were transcribed for a period from late 1978 through March of 1983 by a Honduran physician who was experienced in rural health care. The cases were then classified into two groups: cases involving diarrhoea as a primary or secondary cause of death and cases not involving diarrhoea. The total cases of death in children less than 5 years of age available for analyses was 378, with 206 occurring before the intervention and 172 after the intervention.

Registry data are unreliable for estimating true rates because many deaths go unreported.

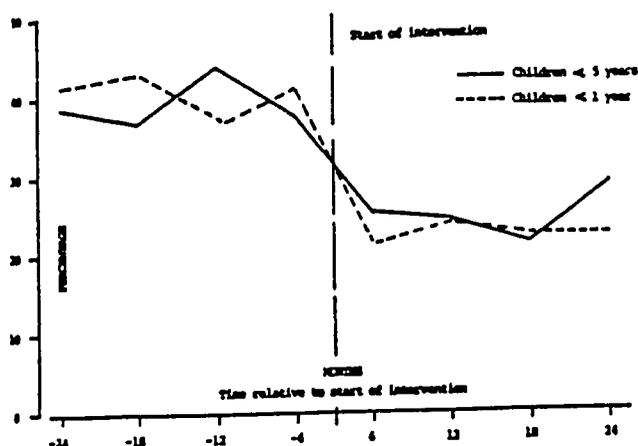


Fig. 4. Percentage of deaths that involve diarrhoea in any way, for 2 years before and after the start of the intervention.

For these reasons, changes in the proportion of deaths associated with diarrhoea are emphasized. In Fig. 4, data are presented for 2 years before and 2 years after the intervention. In children less than 5 years of age, the proportion of deaths involving diarrhoea declined from 39.8 per cent before to 24.4 per cent after the intervention, similar to the decline observed in children less than 1 year old. These declines were statistically significant ($P < 0.01$).

Two clear-cut findings emerge from this analysis. One is that reported diarrhoeal mortality was sharply lower after the campaign than before, and that this drop occurred precisely and suddenly at the introduction of the ORT campaign. The second is that this effect was stable over time and across age groups, so it is unlikely to be the result of random fluctuations.

Caution must be exercised in interpreting these data. The mortality data are of unknown validity and it may not be true that diarrhoeal mortality decreased. For example, it is entirely possible that with the saturation of messages about diarrhoea and ORT that mothers somehow became less likely to report diarrhoea as a cause of death. Some mothers may have been ashamed to admit that their child died of diarrhoea at a time when a highly publicized care was available at no charge.

Conclusion. Compared to commercial campaigns, the Honduras project was enormously successful. It is clear that there was good access to all the communications channels used by the campaign and that the target audience was heavily exposed to campaign messages through those channels. The exposure resulted in learning gains across virtually all the topics covered by the campaign messages and the audience adopted the promoted behaviours at high rates. Finally, there is the possibility that mortality due to diarrhoea was reduced by half.

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