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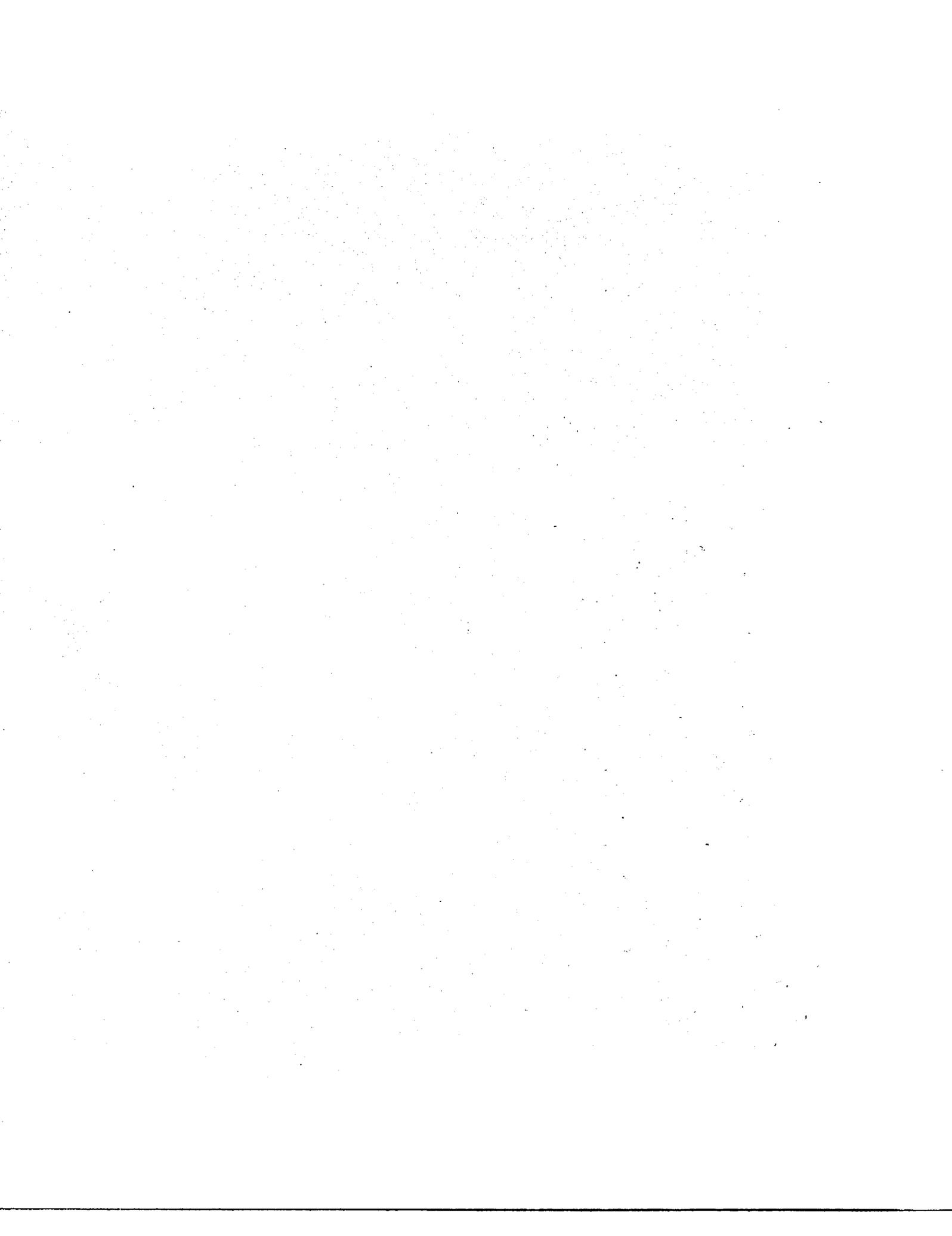
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**MATERNAL BELIEFS AND FEEDING PRACTICES CONCERNING CHILDHOOD
DIARRHEA AMONG MEXICANS**

The University of Arizona

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MATERNAL BELIEFS AND FEEDING PRACTICES CONCERNING
CHILDHOOD DIARRHEA AMONG MEXICANS

by

Mercedes Leticia Martínez Terán

A Thesis Submitted to the Faculty of the
DEPARTMENT OF NUTRITION AND FOOD SCIENCE
In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE
WITH A MAJOR IN DIETETICS

In the Graduate College
THE UNIVERSITY OF ARIZONA

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July 17, 1986
Date

DEDICATION

Este estudio esta dedicado con mucho
cariño a mis padres Gilberto y María
Elena Martínez por su amor, fé, estímulo,
y apoyo atravez de mi vida.

Add all the love of all the parents and
the total sum cannot be multiplied enough
times to express God's love for me, the
least of his children.

Jo Petty

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ABSTRACT

The purpose of the study was to determine the beliefs and child feeding practices followed by Mexican mothers when their children had diarrhea. The study examines the relationship between the following variables and the dietary modifications and perceived causes of diarrhea: mothers' education and age and child's age. A sample of 203 mothers from an urban area in Sonora, Mexico participated in the study.

The study results indicate that dietary modifications during diarrhea were frequently practiced in the medical culture of this society. A significant number of mothers acknowledged the doctor as the source for the dietary management of the disease. The finding revealed a significant correlation between the perceived cause of diarrhea and the child's age ($p < 0.05$). General findings suggest that oral rehydration solutions are well accepted in this population; however, proper advice regarding the dietary management of diarrhea continues to be needed.

CHAPTER 1

INTRODUCTION

The high incidence and severity of childhood diarrheal diseases have been documented for many years, yet today continue to be worldwide problems. Research has shown that this type of disease is the leading cause of morbidity and mortality in infancy and childhood in developing countries (Harland et al, 1981). It is estimated that in children under the age of 5 in the Third World Countries, there are about 1.5 billion episodes of diarrhea and approximately 3 to 6 million children die annually from this cause (Chen, 1983). In Mexico and other Latin American countries, diarrhea is the major cause of childhood mortality (Mota-Hernandez and Velsaquez-Jones, 1984a; Puffer and Serrano, 1973).

Over the past decade, knowledge about the etiology of diarrhea and the normal mechanisms involved in fluid and electrolyte absorption and secretion has rapidly increased. This has resulted in a complete change in attitudes to the initial management of diarrhea (Gracery, 1985).

With the introduction of Oral Rehydration Therapy (ORT), diarrheal mortality indices have significantly

decreased; nevertheless, the morbidity burden from diarrhea which may have equal, if not greater, health consequences than the mortality, continues to be of great significance in underdeveloped countries (Chen, 1983).

For many years, a reciprocal relationship between diarrhea and malnutrition has been postulated; however, this synergistic relationship has not always been demonstrated. The negative nutritional effect of diarrhea operates mainly through a decrease in food intake (Gracery, 1985). In Latin America, malnutrition has been noted to be a direct underlying cause of most deaths of children with diarrhea (Puffer and Serrano, 1973).

In terms of intervention, ORT is the primary treatment of diarrhea; however, the malnutrition-diarrhea cycle demonstrates that there is a good justification for the integration of prompt ORT, dietary management, and diarrhea prevention. The withholding of food during diarrhea is a prevalent practice among mothers, and even doctors, in developing and developed countries. "Intervention belongs first and foremost to the home environment and, therefore, depends on people's perceptions of diarrhea, its prevention and treatment" (Zoysa et al, 1984).

PURPOSE OF THE STUDY

The overall aim of this study was to identify mothers' beliefs with regard to their children during diarrhea, as well as to determine what dietary practices were followed. The first purpose of this investigation was to find out how mothers change the usual dietary pattern of their children at the time of a diarrheal episode. The second main component of this investigation was an attempt to determine the beliefs regarding the etiology of diarrhea and to see whether mothers' education and age, as well as the child's age, may influence the perception of cause, attitudes, and practices followed.

The following specific topics were investigated:

1. Percent of mothers who imposed modifications to their children's diet during diarrhea.
2. Percent of mothers who restricted all type of food during the disease.
3. Relationship between the modifications in diet that were followed and mothers' age and education, as well as the child's age.
4. Food items most commonly reported to be suspended during diarrhea.
5. Percent of mothers restricting breast feeding during diarrhea.

6. Dietary changes during diarrhea depending on the child's age.
7. Percent of children who continued receiving a diet similar to their usual one during the disease.
8. Source of advice for the dietary management that was followed during diarrhea.
9. Percent of mothers using Oral Rehydration Solutions and reasons why they would not use it again.
10. Beliefs regarding the adequacy of diet and the effect on growth of the dietary management that was followed during the diarrheal episode.
11. Perceived causes of the diarrheal episode and its relationship with the child's age, mothers' education, and mothers' age.
12. Number of diarrheic episodes during the past 6 months and their relationship with any dietary modifications.
13. Preferred source of health advice and treatment.

SIGNIFICANCE OF THE STUDY

Diarrhea accounts for most of the deaths of children in developing countries and is associated with a negative impact on growth. It has been postulated that malnutrition causes an increase in incidence of infectious diseases and, conversely, infections exacerbate and/or predispose a malnourished state in children. A number of studies conducted in developing countries have concluded that

diarrheal diseases have a detrimental effect on the physical status of children (Mata et al, 1977; Martorell et al, 1977; Condon-Paoloni et al, 1977; Rowland, Cole, and Whitehead, 1977; Whitehead, 1977).

The adverse effect of diarrhea on nutritional status is primarily attributed to a decrease in food intake, which in some societies results from the traditional belief of food restriction during a diarrheal episode. "This common practice of food withholding exacerbates dehydration and malnutrition contributing to death from childhood diarrhea" (Green, 1985).

It has been recognized that the control of diarrheal diseases depends on the understanding of local attitudes, perceptions, and beliefs regarding the disease (Green, 1985). Traditional beliefs can conflict with modern therapies of nutrition which prevents the implementation of advice concerning the dietary therapy that needs to be followed during diarrhea (Escobar, Salazar, and Chuy, 1983). Therefore, the results from this preliminary study may be a significant contribution in this field because they will provide information regarding the traditional beliefs and practices concerning diarrhea, at the same time may identify the source for the dietary management of the disease. The findings from this study might substantiate the data from other countries which indicate the importance of

understanding these beliefs, and acknowledge the need for educational programs regarding the dietary management of childhood diarrhea.

Introduction of health education programs regarding the treatment of diarrhea should build upon local perceptions and beliefs to be able to have parental acceptance and help in the prevention protein-energy malnutrition (Real et al, 1982). The appropriate health education program in diarrhea should not just advocate the adoption of new practices such as ORT and continuous or early feeding, but should also try to find a way of minimizing conflicts by encouraging beliefs that are useful and discouraging those that are harmful. Zoysa and co-workers stated (1984) "an understanding of behavioral patterns in response to diarrhea will lead to health education messages which address useful and acceptable behavioral changes".

CHAPTER 2

LITERATURE REVIEW

MORTALITY AND MORBIDITY INCIDENCE

A favorable change has been documented in the number of deaths in children under the age of 5 from Asia, Africa, and Latin America. In 1980, the estimate of mortality from diarrhea in these countries was between three and six million children (Mahalanabis, 1983). Estimates from the Mexican population indicate mortality indices of 861.8 per 100,000 children (Mota-Hernandez and Velsaquez-Jones, 1984a).

Diarrhea has been defined by the World Health Organization (WHO) as 4 or more watery stools in 24 hours (WHO, 1985). Obtaining an accurate estimate of the morbidity burden from diarrheal diseases is a difficult task because diarrhea incidence varies every year depending on the country, area, and time of the year. It is also subject to the criteria used by each country in defining diarrhea. Assuming an average of 1 to 3 episodes per child, in 1980 the estimated incidence was of 1.5 billion episodes. Of this, 11.3% were in Latin America, 17.1% in Africa, and 65.9% in Asia (Chen, 1983). The annual number of episodes

in Mexico is calculated to be around 33 million (Rodriguez, 1986).

Data from surveillance studies in developing countries suggest that the diarrhea annual rate ranges from 2 to 12 episodes (Chen, 1983). For example, the incidence of this disease in Guatemala and Mexico is 8 and 3 episodes per year, respectively (Mata et al, 1978; Rodriguez, 1986).

In the Third World countries diarrheal diseases have a higher occurrence during the summer, whereas developed countries present a peak in the winter. Furthermore, the prevalence of diarrhea seems to be higher in males than in females, in children between 6 months and 2 years of age, and in babies less than 6 months when they are being fed formula or cow's milk (Nazer, 1982; Black et al, 1982; WHO, 1985).

DIETARY MANAGEMENT OF DIARRHEA

What constitutes the appropriate dietary management during diarrhea is still debatable. The traditional treatment for diarrhea consisted in fasting for 24-48 hours, then gradually advancing from clear liquids to diluted cow's milk or formula and finally slowly reintroducing the normal or usual diet (Lebenthal and Rossi, 1983; Dugdale et al, 1982). The rationale involved in withholding food from the child is founded in the histological abnormalities of the intestinal mucosa and the temporary disaccharidase

deficiencies (especially lactose) often seen during diarrhea (Soenarto et al, 1979; Dagan, Gorodischer, and Moses, 1984). Consequently, there was, and still is, a common practice among some pediatric professionals to restrict feeding until diarrhea resolves because early introduction of food, especially milk, could aggravate the illness and exacerbate the intolerance caused by the damage to the intestinal mucosa (Santosham et al, 1985). However, this conventional therapy often exacerbates the diarrheic episode and may lead it to become persistent, self-perpetuating, and intractable (Lebenthal and Rossi, 1983). Intractable diarrhea, plus a low calorie treatment commonly results in severe malnutrition. It has been stated that many days of refeeding are needed to recover the 1-2% of weight lost daily caused by fasting (Soeprato, Soenatro, and Nelwan, 1979; Rhode, 1978). There are warnings from developing countries that diluted feedings lead to further malnutrition and gut dysfunction by the decreased caloric intake in an already malnourished child (Placsek and Walker-Smith, 1984). However, in Mexico, as well as in many other countries, the first step on the management of diarrhea for a child receiving formula or cow's milk consists of diluting the milk feedings to half concentration (Garcia, 1982).

In 1924, Park stated "the child's net balance of nutrients, rather than the number of stools should be the primary concern" during diarrhea. However, it was not until recently that recognition of the deleterious effects of starvation during diarrhea lead some to urge the early introduction of nutritional supplementation for its management. Therefore, continuous breast feeding and introduction of food as soon as possible after the onset of diarrhea is now being promoted by the WHO and several hospitals from developing countries including Mexico (WHO, 1976, 1985; Velasquez-Jones et al, 1985).

The results from a number of clinical studies indicate that ORT and early, rapid, and adequate caloric intake reduce weight loss, hospital stay, and duration of the illness (Isolauri and Vesikari, 1985; Soeprapto et al, 1979; Mahalanabis, 1981; Dugdale et al, 1982; Samadi, Ahmed, and Bardhan, 1985). According to Molla and co-workers (1982) feeding during a severe diarrheic episode should be encouraged because substantial absorption does take place.

The beneficial effects of breast feeding in protecting a child against infectious diseases have been known for many years. Pooled results from 35 studies in developing and developed countries showed agreement concerning the protective qualities of breast feeding against diarrhea morbidity, irrespective of the level of hygiene (Feachem and

Koblinsky, 1984). Moreover, diarrhea incidence and diarrhea-related mortality in Mexico and other Latin American countries is lower in children who are breast-fed (Puffer and Serrano, 1973; Feachmen and Koblinsky, 1984; Academia Mexicana de Pediatría, 1984)). Some studies have found that breast feeding is favorable, even in combination with bottle feeding during the first few months, whereas others attributed this benefit only to exclusively breast-fed children (Lopez-Bravo, Cabiol, and Arcuch, 1984; Schmidt, 1983; Fallot, Boyd, and Oski, 1980). Unfortunately, during the past few years an alarming decline in breast feeding and an increased incidence of bottle feeding has been observed. A trend towards early weaning and decrease in the average duration of breast feeding has been detected in Latin American countries including Mexico (Delgado et al, 1985; Garcia et al, 1985; Magana et al, 1981; Dewey, 1983a,b; Avila, Arroyo, and Garcia, 1980). "Bottle feeding in resource-poor countries increases the risk of certain infections greatly, especially diarrheal diseases" (Jelliffe and Jelliffe, 1978).

BELIEFS AND PRACTICES CONCERNING THE TREATMENT OF A DISEASE

Although sickness is a universal condition, the way people perceive and react to it depends on the belief system of their cultural group (Clark, 1982).

Transculturally, folk and modern medicine are the two types of practices used to provide health care. For years the importance of recognizing and understanding the cultural viewpoint about health and disease has been emphasized since it may influence the outcome of treatment (Fosu, 1981). The way modern medicine perceives the etiology and treatment of a disease conflicts with folk medicine to a point that it may inhibit the acceptance of health care services (Young, 1981). Chen Ho (1985) states "health professionals need to understand the interaction between traditional remedies and modern medicine to be able to achieve better communication and establish better relationship with the clients".

Dietary modifications during illness and recovery are frequently practiced in the medical culture of many communities. Real and co-workers (1982) stated that during illnesses, "beliefs assume a very important role because they lead to food restrictions and preferences which if severely imposed compromise the nutritional status ...". Traditional remedies have been retained and occasionally promoted by health professionals even where modern medicine has become widely accepted (Chen Ho, 1985; Gordillo-Paneagua, G., 1984a).

BELIEFS AND PRACTICES DURING DIARRHEA

The dietary treatment followed during diarrheal diseases is usually influenced by beliefs, values, habits, and previous experiences. Mothers from underprivileged societies still adhere to the popular belief that it is necessary to withhold certain foods from a child who suffers diarrhoea without considering the detrimental effect that this has on the nutritional status of the child (Booth and Harries, 1982). "Due to taboos, foods are retained from the diet when they are more needed" (Landerman, 1985).

Despite the strong emphasis that has been placed on continuous feeding during diarrhoea through educational programs, these beliefs are still quite prevalent. For instance, in the Philippines, the majority of the mothers (55%) suspended breast milk during diarrhoea, but a significant decline (from 25 to 5%) was detected in the number of mothers reporting withholding of all foods (International Study Group, 1981b).

Causes of Diarrhoea and its Treatment

Few studies have analyzed maternal beliefs and therapeutic preferences related to diarrheal diseases. This section presents some of the studies that have been done in other countries on this topic. Diarrhoea related beliefs vary from community to community; for example, in some societies it is believed that dirty or unsuitable foods

cause diarrhea and caution is taken in providing oral feedings. Moreover, others believe that the cause of diarrhea is malabsorption, therefore, bowel rest is the treatment of choice (Cutting, 1985). Studies done in India indicated that hot weather, heat in the body, and teething were the most frequently believed causes of diarrhea. Food and water restriction was commonly practiced as treatment. Milk was often withheld since it was classified as "hot" food, whereas "cold" foods were frequently allowed (Kumar, Nada, and Vanaja, 1982; Lazzof, Kamath, and Feldman, 1975). Some other places in Latin America such as Puerto Rico, Mexico, and Brazil also classify diarrhea as a "hot" disease and only "cold" foods are allowed during the treatment (Escobar et al, 1983; Nations, 1982).

On the other hand, in Peru, diarrhea is believed to be caused by the invasion of the body by cold or by the ingestion of food classified as cold. Only 5.5% acknowledged infection as the cause of diarrhea. Suspension of milk and foods was a "should" treatment according to 60.4% and 31.9%, respectively, versus 28.6% who preferred a treatment of continuous feeding of milk and food. The home remedies most frequently used were broth without salt and herbal infusions (Escobar et al, 1983).

Contrary to the countries that fall into the hot-cold dichotomy, the Akamba classify diarrhea as a God-given

disease since it affects all children. They recognize two types of diarrhea: teething and sickness diarrhea. The treatment consists of traditional herbs (Maina-Ahlberg, 1979).

The causes of diarrhea in the Zimbabwe population are classified into two broad classes: physical and social/spiritual. A significant number of mothers acknowledged that elements of their polluted environment, such as dirty water (51%) and flies (26%), were the etiological agents of diarrhea. Among the causes classified as social/spiritual, "fontanelle" disease was the most frequently mentioned. Only 5% of the mothers mentioned sunken fontanelle as a consequence of diarrhea versus 20% who saw it as the cause. The action taken in response to diarrhea varied depending on the etiology of the disease. Indigenous remedies were mentioned by 28%, but withholding of food was reported by less than 1% (Zoyza et al, 1984).

Green (1985) did a study in the Swazi culture to investigate healers' beliefs regarding childhood diarrhea. Most healers did not consider water or feces as the cause of diarrhea. They recognized 3 types of diarrhea which were based on the seriousness of the disease, with the treatment depending on the etiology. Sunken fontanelle was not seen as a consequence of diarrhea or loss of water but as a symptom equivalent to diarrhea. The treatment for diarrhea

consisted of enemas, traditional vaccines, and herbal drinks. Most healers acknowledged breast feeding as the best food during diarrhea and felt that the normal diet should be continued. Only 2% of the healers thought that diarrhea could be cured by modern medicine. In some other societies, such as the Mexican, sunken fontanelle is also seen as a disease which may cause diarrhea (Werner, 1986).

In developing countries attitudes regarding the cause and treatment of diarrhea are different. For example, in New Zealand, 75% recognized infections and 47% lack of hygiene as the causes of diarrhea. Ninety eight percent stated that fluid and 40.7% that food should be given during diarrhea (Brieseman, 1984).

MOTHERS' EDUCATION AND AGE

Mothers' education and age often influences the prevention practices and decisions made regarding the treatment of an illness. "Literacy helps to interpret the health message correctly as well as to assimilate it within the existing traditions of child care" (Pinto et al, 1985). In some countries it has been found that maternal education influences positively the mortality rate of infants (Scheer et al, 1985) and turns people away from traditional healers (Kroger, 1983).

Diarrhea and Mothers' Education and Age

In a recent study done in India it was found that mothers who attended an Adult Education Program tended to withhold food during diarrhea less frequently (Pinto et al, 1985). Kumar and co-workers' study (1985) gave evidence indicating that illiterate mothers believed more in the traditional causes of diarrhea such as excessive heat and teething. Also, these mothers did not see dehydration as a consequence of diarrhea and restriction of fluids was quite prevalent. The therapeutic preferences were also more inappropriate in the illiterate mothers. Literate mothers were more familiar with ORS.

Contrary to the results from the study in India, Zoysa and co-workers (1985) did not find any relationship between mother's education and the perceived cause of the disease. Likewise, in the Akamba population the education level of mothers did not influence the type of medical care used to treat diarrheal episodes (Maina-Ahlberg, 1979). In Peru, mothers' education was not associated with the child's dehydration. Even young women attending high school were quite ignorant regarding the treatment of diarrhea. However, "cold" was acknowledged more frequently as the cause of diarrhea by mothers who had primary school education or less (Escobar et al, 1983).

In some societies, the age of people influences their health behavior (Kroger, 1983). For instance in the Akamba culture, withholding of food during measles increases as mothers' age increases (Maina-Ahlberg, 1979). In a study done in Zimbabwe, the age of the mother did not influence the beliefs about the causation of diarrhea (Zoysa et al, 1984).

ORAL REHYDRATION THERAPY

During the past two decades, there have been remarkable advances regarding the treatment of diarrhea. The development of Oral Rehydration Therapy (ORT) as a simple, inexpensive, and effective medical treatment has brought a radical change in the management of diarrhea as well as in the incidence of mortality.

In 1978, the WHO developed a diarrheal disease program which consisted in providing a standard glucose-electrolyte solution (WHO-ORS) as the primary treatment for diarrhea (Merson, 1985). An infinite number of field testings have testified to the adequacy and safety of the WHO-ORS in hospitalized and ambulatory children of all ages, nutritional status, and countries, including Mexico (Coker et al, 1983; Metha and Patel, 1984; International Study Group, 1981a, 1981b; Velasquez-Jones et al, 1985; Santosham et al, 1982, Deorari et al, 1984; Palacios-Trevino et al, 1985).

The decrease in mortality, which is the key index of success, has firmly established the effectiveness of the ORS at the clinical and home level. Developed and developing countries have noted a significant decrease in mortality incidence in children from diarrheal diseases (Lasch et al, 1983; Frankel and Lehmann, 1984; Rahaman et al, 1979; Clow, 1985; Gracery, 1985).

Investigators from several hospitals and community studies describe weight gain or a reduction in the impairment of weight gain in children who received early ORT (Mahalanabis, 1981; International Group, 1981b). The mechanism involved in the nutritional benefits of the ORS is speculative. Improvement of appetite and provision of an adequate diet may play a key role in the recovery of the child (Mahalanabis, 1981; Brown and MacLean, 1984; Booth and Harris, 1982). However, Rowland and Cole (1980) stated that ORS may have a limited effect on growth if a nutritionally sound diet is not provided.

Beliefs and Practices Regarding ORS

The use of the ORS at the home level, although effective, is not extensively used by mothers and its function is not well understood. In India, only 16.5% of the mothers were familiarized with the ORS. Ninety percent of these mothers stated that they would use it again and 82% knew the correct method of preparation and administration

(Kumar et al, 1985). Even in developed countries such as New Zealand, a very small percent of mothers indicated the need for electrolytes during a diarrheal episode (Brieseman, 1984). In some societies, the introduction of ORS may not be well accepted due to the belief system under which they live. In India, diarrhea is considered a "hot" disease and sugar is felt to be "hot"; therefore, it is not appropriate to use sugar to treat diarrhea (Lazoff et al, 1978).

In the Swazi population, ORS was used by the majority of the mothers only when traditional medicine failed to stop the diarrhea. Healers from this society appear to be confused about the function of the ORS (Green, 1985). Data from few other studies also indicated misunderstanding regarding the use of ORS. For example, in Peru and the Philippines, it was frequently believed that ORS stopped diarrhea (Escobar et al, 1983; International Study Group, 1981b).

CHAPTER 3

METHODOLOGY

The study was designed to investigate the beliefs and dietary practices followed during childhood diarrhea. This chapter presents the setting, sample, and methodology including the data collection, research questions, and data analysis.

SETTING AND SAMPLE

Data were collected from two government hospitals in Hermosillo, Sonora, Mexico during July and August of 1985. The study population included 203 mothers whose children were hospitalized with gastroenteritis or who had brought their children to the emergency room or the out-patient clinic with the complaint of diarrhea. The children of these mothers had to meet the following criteria in order to become study participants:

1. children had to be between 2 months and 3 years of age.
2. children were hospitalized with the diagnosis of gastroenteritis or
3. children were experiencing or had experienced diarrhea within the past 5 days.

When the directors of the two hospitals were contacted, the purpose of the study was explained and a copy of the questionnaire was presented. After permission was obtained to visit the Pediatric and Infection Units of both hospitals, the investigator obtained a list of children's names who were hospitalized with the diagnosis of gastroenteritis. Mothers of the children were contacted at the hospital during the time of their daily visits and, if they agreed, the interview was conducted at that time or when the mothers indicated a better time.

The second method of obtaining participants was by asking all mothers who attended the emergency room if their children were experiencing diarrhea. If a positive response was obtained, then mothers were asked to participate in a survey (the word study was not used due to the lack of familiarity and understanding of some people to this term). If mothers agreed to participate, the interview was conducted while the mother waited for her turn to see the doctor or after she had seen the doctor.

The third method used to obtain participants was through the out-patient clinics from both medical facilities. The procedure followed in these settings was for the investigator to ask mothers who were waiting to see the doctor if their children were presently experiencing

diarrhea or had suffered diarrhea within the past 5 days. A total of 203 respondents participated in the study.

PROTECTION OF HUMAN RIGHTS

Due to the diversity of mothers' literacy, a written consent was not provided; however, before interviewing each mother, the investigator explained the purpose of the study, it's non risk status, and assured anonymity.

The Human Subject Review Committee of the University of Arizona considered the study exempt from review.

THE QUESTIONNAIRE

The instrument used to identify the beliefs and practices of Mexican mothers regarding childhood diarrhea was a questionnaire (Appendix A). The questionnaire was developed in Spanish. The research questions and basic structure were adapted from a questionnaire used for a similar study being simultaneously conducted in Egypt (Galal et al, 1986). The questions were then reviewed and modified based on recommendations and as a result of the pilot test with three Spanish speaking mothers from Tucson, Arizona. The instrument was further pilot tested with three mothers from Hermosillo.

The first few questions of the interview dealt with personal characteristics including the child's birthdate, age, and sex, and the mother's age. The second set of

questions described the usual feeding pattern of the child. The following questions were related to mothers' practices and beliefs regarding the present diarrheic episode. Then, a few questions were asked about ORT, incidence of diarrhea, behavior towards seeking health, and general questions including number of children, education, jobs, and home facilities. The interview took an average of about 15 minutes. The investigator conducted all the interviews herself.

DATA ANALYSIS

Following completion of the interviews, data were transferred to a computer for analysis. Frequencies, percentages, and cross-tabulations between variables were computed. Chi-Square was used to test the relationship between variables.

The following assumptions were made regarding the study.

Assumptions:

1. mothers answered honestly and to the best of their abilities.
2. mothers were taking care of their children or knew what was being given to their children by the person who was taking care of them.

The study had several limitations regarding it's population.

Limitations:

1. the sample was not randomly selected.
2. the study included only mothers who had or brought their children for treatment to a hospital.
3. the study was limited to the State of Sonora and prevents generalization to mothers elsewhere in the country.
4. reliability and validity of the information obtained.

CHAPTER 4

RESULTS

CHARACTERISTICS OF THE SAMPLE

The sample consisted of 203 mothers who met the pre-selected criteria. Mothers were Mexican residents and were living in the State of Sonora. Eighty percent of the participants were obtained through the outpatient clinics and emergency rooms of a pre-paid plan hospital for middle and low income class people and a State government hospital for low income class people. The remaining twenty percent of the mothers interviewed had their children hospitalized, at the same two hospitals, with the diagnosis of gastroenteritis (Table 1).

Table 1. Population Sites

SITES	N (INTERVIEWS)	%
HOSPITALS	41	20.0
OUTPATIENT CLINICS/ EMERGENCY ROOMS	162	80.0

Childrens' Characteristics

The children ranged in age from 2 to 36 months, since the criteria for participation specified that children had to be between that ages. The mean age was 9 1/2 months (Figure 1). Sixty percent of the children were males and 40% were females (Table 2).

Figure 1. Distribution of Children by Age (N=203)

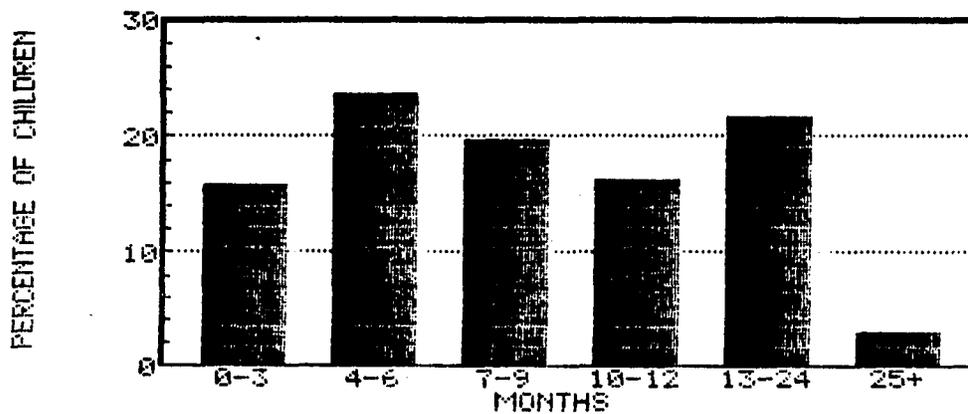


Table 2. Distribution of Children by Sex (N=203)

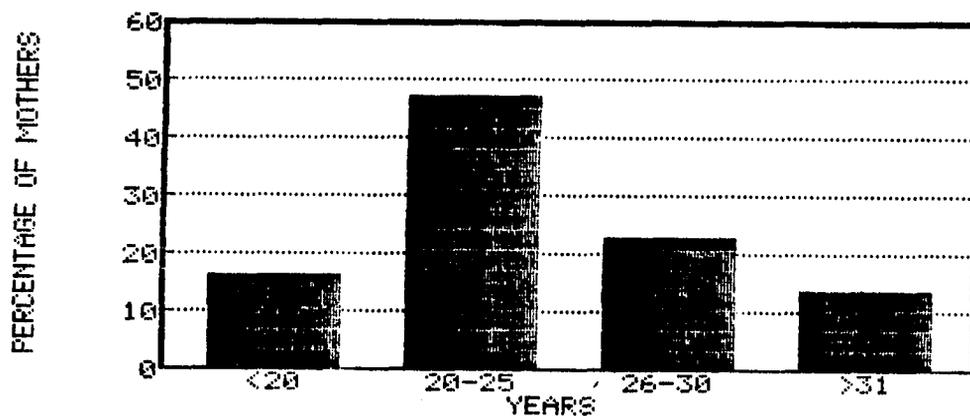
SEX	N	%
FEMALES	80	40
MALES	123	60

Thirty five percent (71) of the children in the study had been hospitalized due to diarrhea. Of these, 58% (41) were hospitalized at the time of the interview. Forty percent (16) of the hospitalized children at the time of the data collection were 2 months of age.

Mothers' Characteristics

Figure 2 presents the distribution of the 203 mothers by age categories. The mean age was 25 years with a range of 16 to 52 years and a mode of 24 years.

Figure 2. Distribution of Mothers by Age (N=203)

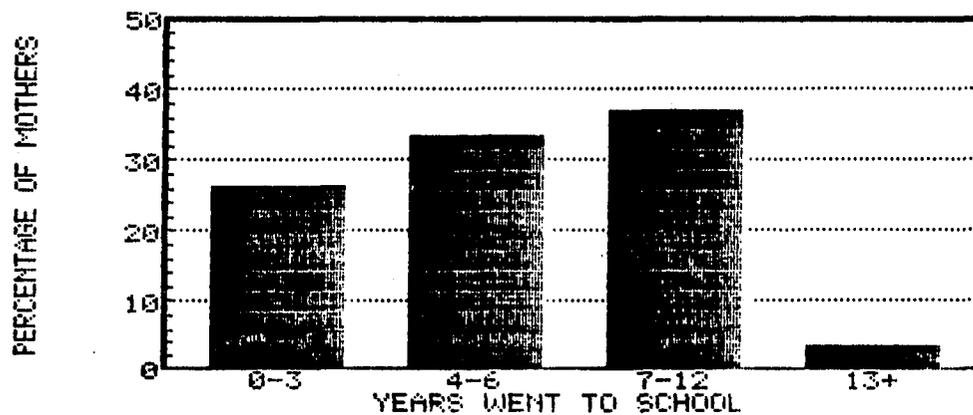


Ninety four percent of the mothers knew how to read and write (Table 3) and 59% had completed elementary school. The mode and mean number of years in school were 6 and 5.7 (Figure 3).

Table 3. Distribution of Mothers' Literacy (N=203)

READ & WRITE	N	%
YES	191	94.1
NO	12	5.9

Figure 3. Distribution of Mothers' Level of Education (N=203)



Economic Level

Of the participants in the study, 58% reported having an income of \$42,000 pesos (70.00 dollars) or less a month. Forty percent of the participants did not answer to the question. The reasons for the "no response" included: "I don't know how much my husband makes, he only gives me \$....", non-permanent job, unemployment, and monthly variability of income. Thirty seven percent of those who did not answer to this question had probably an income of less than 42,000 pesos, based on an assumption from the investigator depending on the type of job or the unemployment status.

SUBJECT RESPONSES TO QUESTIONS REGARDING PRACTICES DURING DIARRHEA

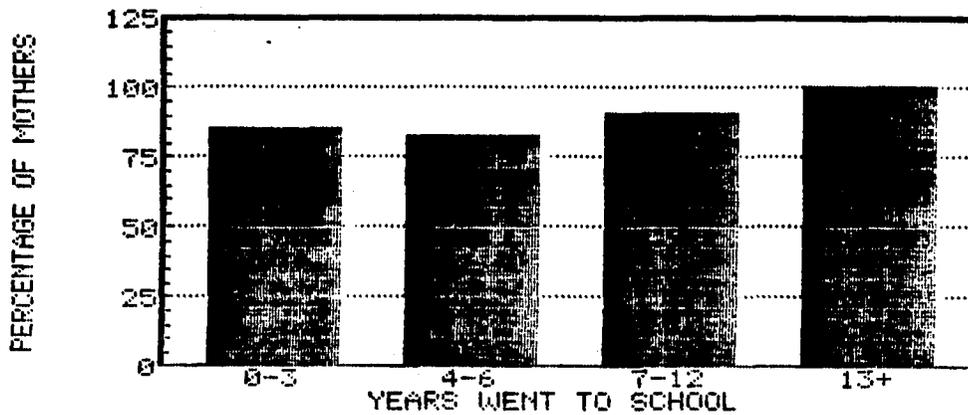
This section addresses the dietary modifications followed by mothers during diarrhea. Eighty six percent (176) of the mothers responded that they had changed their children's usual diet during diarrhea (Table 4).

Table 4. Mothers Who Changed their Children's Usual Diet During Diarrhea (N=203)

CHANGED DIET	N	%
YES	176	86.70
NO	27	13.30

The educational level of the mothers was not associated with the practices followed during diarrhea ($p < 0.05$). As illustrated in Figure 4, mothers changed their children's usual diet even when they had high levels of education. All the mothers who had completed high school changed the diet of their child during the diarrheal episode.

Figure 4. Percent of Mothers Who Changed their Children's Usual Diet During Diarrhea by Mother's Level of Education (N=203)



Mothers' age was also unrelated to the practice of modifying the children's diet during a diarrheal disease. Regardless of the maternal age, 80-90% of the mothers changed the usual diet of their children during the disease (Figure 5).

Figure 5. Percent of Mothers Who Changed their Children's Usual Diet During Diarrhea by Mother's Age (N=203)

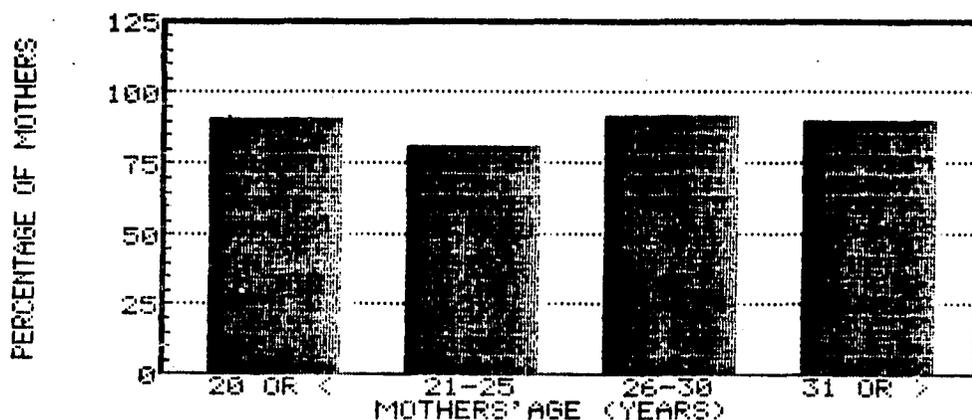
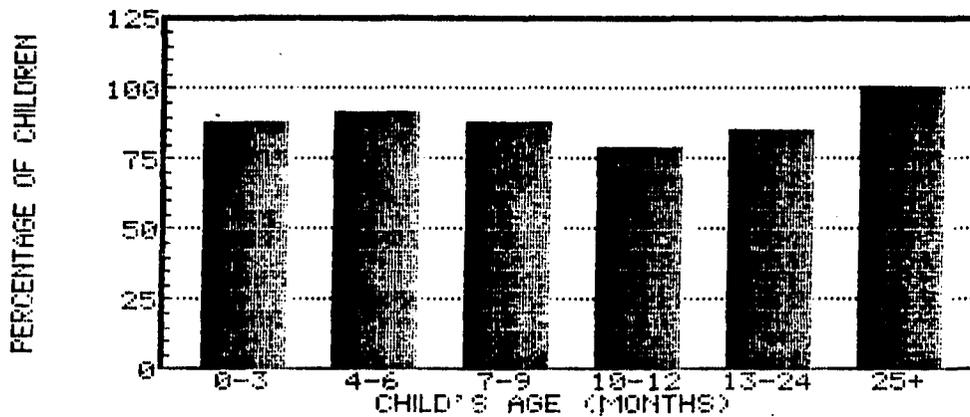


Figure 6 shows that the child's age was not significantly related to the common practice of modifying the usual diet of the child. Diet was changed during the diarrheal episode in more than 80% of the children in each age category.

Figure 6. Percent of Mothers Who Changed their Childrens' Usual Diet During Diarrhea by Child's Age (N= 203)



Of the 176 mothers who changed their children's diet, 11.8% (24) indicated that they restricted all types of food during diarrhea. There was no relationship between the mother's education and the percentage of mothers who decided to stop all types of food during diarrhea. Even though a larger percent (27.7%) of the mothers who followed this practice were those who did not go to school or who went to school between 1-3 years, data analysis indicated that it was not statistically significant (Table 5).

Table 5. Practice of Restricting All Food During Diarrhea by Mothers' Education (N=24)

Years of School	N	%
0-3	9	27.7
4-6	5	7.4
7-12	9	12.0
13+	1	14.3

A significant relationship was not reflected between mother's age and the practice of withholding all food during diarrhea (Table 6). However, mothers between 21-25 years of age were less likely to follow this practice (6.5%) than were younger mothers (13.5%) or older mothers (15.2% (26-30 years) and 17.9% (31+ years)).

Table 6. Practice of Restricting All Food During Diarrhea by Mothers' Age (N=24)

Years	N	%
20 or <	7	13.5
21-25	5	6.5
26-30	7	15.2
31 or >	5	17.9

Although statistical analysis revealed no significant relationship between the age of the child and the decision of the mother to restrict all types of food during the diarrheal episode, there is a consistent trend (Table 7). Mothers with children less than 6 months of age seemed to follow this practice more often than mothers with older children. Twenty five and 16.7% of the mothers with children 2-3 and 4-6, respectively, withheld all food from the diet versus 7.5%, 6.1%, and 6.8% of the mothers with children ranging from 7-9, 10-12, and 13-24 months, respectively. None of the children who were 25+ months were maintained on a completed restricted diet.

Table 7. Practice of Restricting all Food During Diarrhea by Child's Age (N=24)

Months	N	%
0-3	8	25.0
4-6	8	16.7
7-9	3	7.5
10-12	2	6.1
13-24	3	6.8
25+	-	-

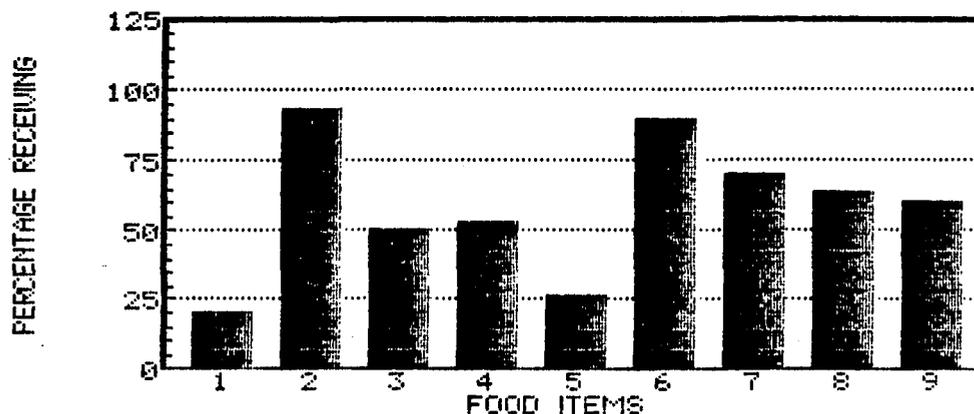
Table 8 presents data for the number of days that mothers who restricted all food maintained their children on this regimen. Forty two percent (10), 25% (6), and 33% (8) had their children on this starvation diet for 0-3, 4-6, and >6 days, respectively.

Table 8. Days on this Diet for those Who Stopped all Types of Food During Diarrhea (N=24)

Days On The Diet	N	%
0-3	10	41.6
4-6	6	25.0
>6	8	33.3

Figure 7 shows the percentage of children who were receiving each food item during their usual diet. Twenty percent (40) of the children were being breast fed and 10.0% (4) of these children were 12 months or older. However, 93% (189) were receiving other milk or a combination of both. Cereal and beans were part of the usual diet of 50% (103 and 108 respectively) of the children. Beans were not part of the diet of any of the children who were less than 3 months old. Cheese was being given to 26% (53) and only one child less than 6 months was receiving it. The food items most frequently given were fruits/vegetables (90%), meat (70%), eggs (64.5%), and breads (60%).

Figure 7. Percent of Children Receiving each Food Item During their Usual Diet (N=203)

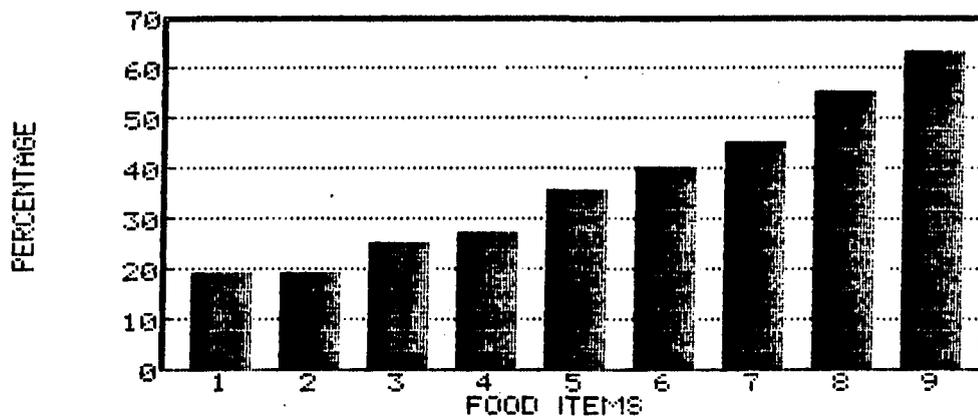


1- breast milk (N=40)
 2- other milk (N=189)
 3- cereal (N=103)
 4- beans (N=108)

5- cheese (N=53)
 6- fruits/vegetables (N=183)
 7- meat (N=142)
 8- eggs (N=131)
 9- breads (N=123)

Responses to the question "how did you change the usual feeding pattern of your child since he/she got sick with diarrhea" indicated that fruits/vegetables and breads were the food items less frequently suspended (19%), during diarrhea, to those children whom their mothers had reported these as being part of their usual diet. Eggs and milk (other than breast milk) were withheld by 63% (83) and 55% (105) of the mothers, respectively. Unfortunately, 25% of the mothers who were breast feeding stopped during diarrhea (Figure 8).

Figure 8. Food Items Reported Stopped During Diarrhea

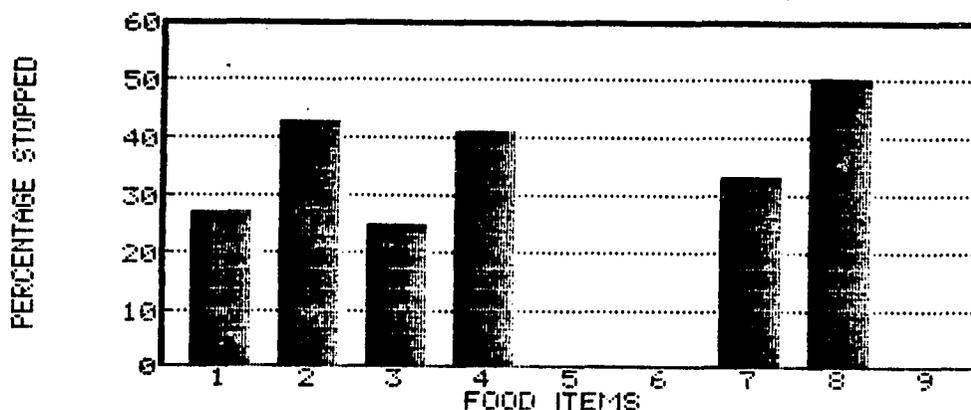


1- fruits/vegetables (N=35)
 2- breads (N=23)
 3- breast milk (N=10)
 4- meat (N=39)

5- beans (N=39)
 6- cereals (N=41)
 7- cheese (N= 24)
 8- other milk (N=105)
 9- eggs (N=83)

For children 2-3 months of age, eggs (50%)*, other milk (43%), and fruits/ vegetables (41%) were the foods most usually restricted in those children who were receiving it before the diarrheal episode. Breast milk, cereal, and meat were stopped by 27% (3), 25% (2), and 33% (1), respectively (Figure 9).

Figure 9. Dietary Changes During Diarrhea in 2-3 Month-Old Children (N= 32)



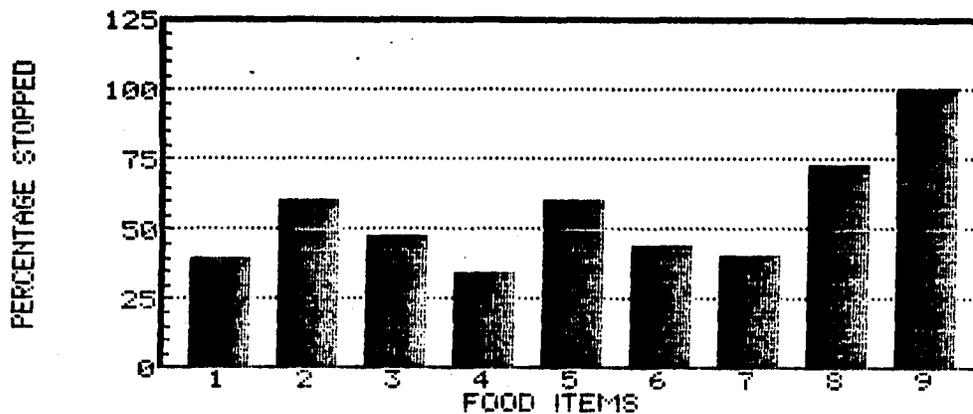
1- breast milk (N=11)
 2- other milk (N=28)
 3- cereal (N=8)
 4- fruits/vegetables (N=17)
 5- beans (N= 0)

6- breads (N=0)
 7- meat (N=3)
 8- eggs (N=2)
 9- cheese (N=0)

* All percentages were calculated based on the number of children who were receiving the food items during their usual diet for that age category.

In children from 4-6 months of age, cheese, eggs, beans, and other milk were withheld from the diet to 100%* (1), 73% (16), 60% (9), and 60% (28) of the children, respectively. Breast milk was suspended to 40% (6) of the children who were receiving it for that age category (Figure 10).

Figure 10. Dietary Changes During Diarrhea in 4-6 Month-Old Children (N=48)



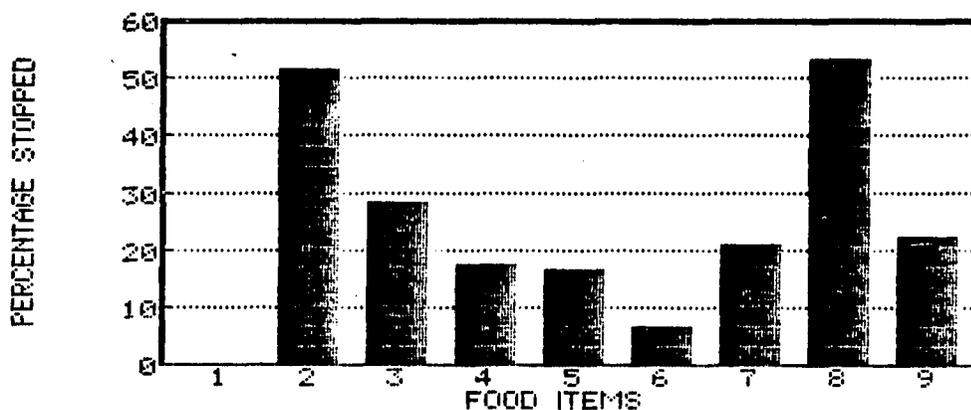
1- breast milk (N=15)
 2- other milk (N=47)
 3- cereal (N=29)
 4- fruits/vegetables (N=44)
 5- beans (N=15)

6- breads (N=16)
 7- meat (N=27)
 8- eggs (N=22)
 9- cheese (N=1)

* All percentages were calculated based on the number of children who were receiving the food items during their usual diet for that age category.

Other milk and eggs were the two food items that were stopped in the diets of more than 50%* of the children of age 7-9 months. Breast milk was continued to be provided to all the children (6) and breads to 93% (28). All the other food items were continued to be provided in 70-83% of the children's diet (Figure 11).

Figure 11. Dietary Changes During Diarrhea in 7-9 Month-Old Children (N=40)

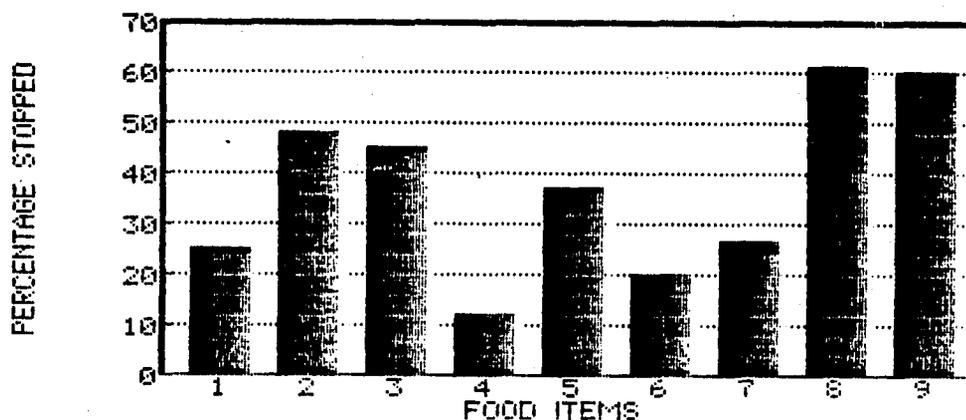


- | | |
|-----------------------------|------------------|
| 1- breast milk (N=6) | 6- breads (N=30) |
| 2- other milk (N=37) | 7- meat (N=33) |
| 3- cereal (N=21) | 8- eggs (N=30) |
| 4- fruits/vegetables (N=40) | 9- cheese (N=9) |
| 5- beans (N=24) | |

* All percentages were calculated based on the number of children who were receiving the food items during their usual diet for that age category.

Data analysis in children 10-12 months old revealed that eggs (61%)*, cheese (60%), other milk (48%), and cereal (46%) were the foods most frequently suspended. Fruits/vegetables and breads were continued by 88 and 80% of the mothers, respectively (Figure 12).

Figure 12. Dietary Changes During Diarrhea in 10-12 Month-Old Children (N=33)



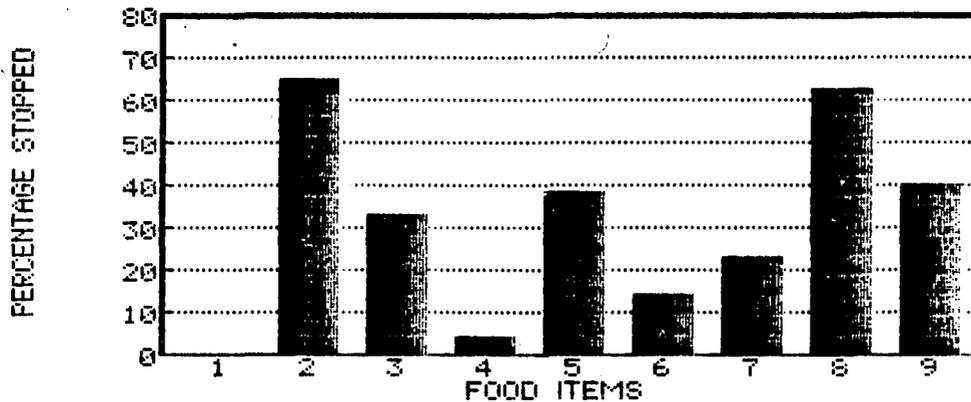
1- breast milk (N=4)
 2- other milk (N=31)
 3- cereal (N=11)
 4- fruits/vegetables (N=32)
 5- beans (N=27)

6- breads (N=30)
 7- meat (N=30)
 8- eggs (N=31)
 9- cheese (N=10)

 * All percentages were calculated based on the number of children who were receiving the food items during their usual diet for that age category.

Similarly, cheese, eggs, and other milk were suspended by 40%* (2), 63% (25), and 65% (26) of the mothers of children between the ages of 13 to 24 months. Fruits/Vegetables and breads were continued by 96% and 85% of the mothers, respectively. Breast milk was not withheld from any of the children (25%) (Figure 13).

Figure 13. Dietary Changes During Diarrhea in 13-24 Month-Old Children (N=44)



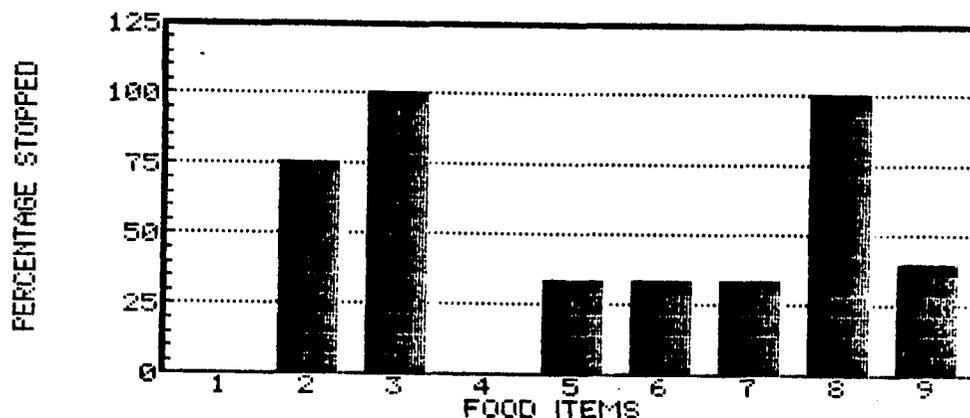
1- breast milk (N=4)
 2- other milk (N=40)
 3- cereal (N=30)
 4- fruits/vegetables (N=44)
 5- beans (N=36)

6- breads (N=41)
 7- meat (N=43)
 8- eggs (N=40)
 9- cheese (N=5)

* All percentages were calculated based on the number of children who were receiving the food items during their usual diet for that age category.

Eggs and cereal were restricted from the diet of all the children who were 25 months or older (6). Seventy five percent* (4) of these had other milk withheld. All other food items were continued in the diets of around 50% of the children. Breast milk was not part of the usual diet in any of these children (Figure 14).

Figure 14. Dietary Changes During Diarrhea in 25+ Month-Old Children (N= 6)



1- breast milk (N=0)
 2- other milk (N=5)
 3- cereal (N=4)
 4- fruits/vegetables (N=6)
 5- beans (N=6)

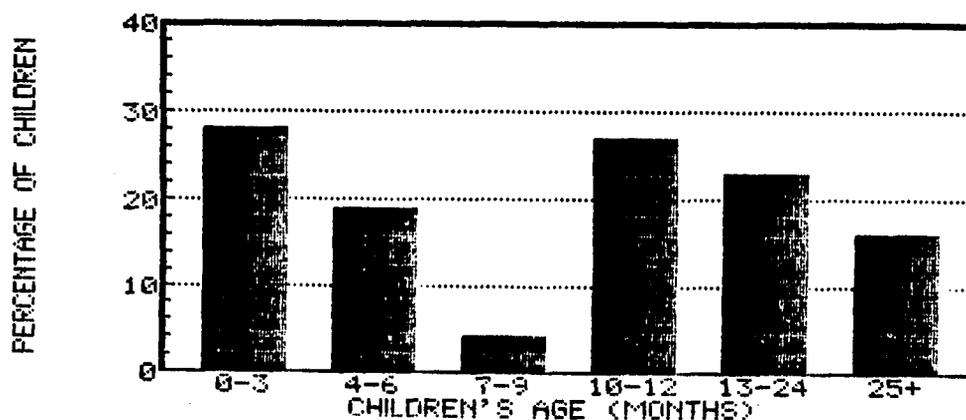
6- breads (N=6)
 7- meat (N=6)
 8- eggs (N=6)
 9- cheese (N=5)

* All percentages were calculated based on the number of children who were receiving the food items during their usual diet for that age category.

Rice water was started during diarrhea by 50.3% (102) of all the mothers and 8% (16) increased the amount that they were usually providing. Likewise, starch/ corn pudding was introduced or reintroduced to 63% (127) of the children.

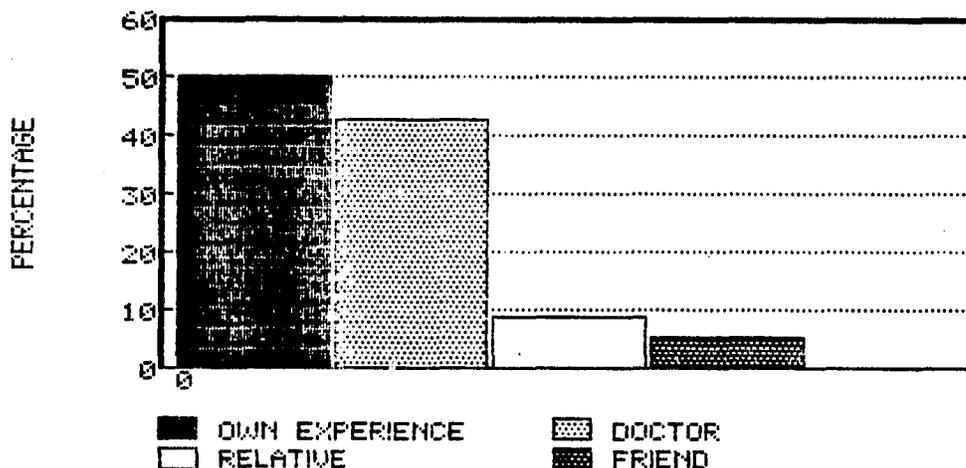
Children were categorized into 4 groups based on the number of food items that were being received on the usual diet. Group 1 were all those children whose diet consisted only of milk, group 2, 3, and 4 were those who were receiving milk plus 1 other item, 2 items, and 3+ items, respectively. Of the 176 children for whom the usual diet was changed during the diarrheal episode, only 54 (31%) stayed in the same feeding category they were before they got diarrhea. Children between 7-9 months were less frequently maintained in a diet similar to their usual one (Figure 15).

Figure 15. Children Who Stayed in the Same Feeding Category After the Dietary Changes During Diarrhea (N=56)



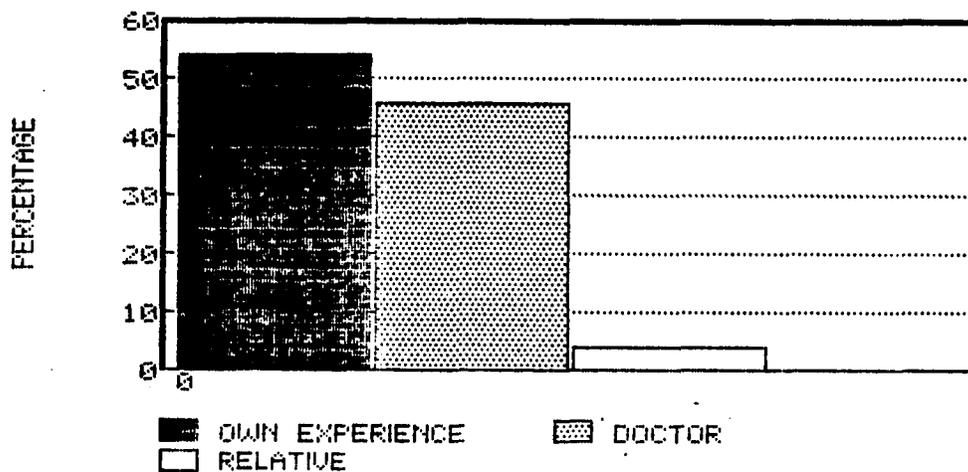
For the question who gave the advice for the dietary management followed during diarrhea, multiple responses were allowed. According to the data, 50% (101) responded "from their own experience", 43% (87) "from the doctor", 8% (16) "from a relative", and 5.5% (11) "from a friend" (Figure 16). Several mothers responded that advice came from a combination of the doctor and their own personal experience.

Figure 16. Who Advised the Diet During Diarrhea (N=203)



Forty six percent (11) of the mothers who stopped all types of food (24) were advised by the doctor, 54% (13) utilized their own experience, and only 4% (1) were advised by a relative (Figure 17). Of the 109 mothers who stopped either breast milk or other milk, 41% (45) did so because of own experience, 51% (56) received the advice from the doctor, 5.5% (6) from a relative, and 6.4% (7) from a friend.

Figure 17. Who Advised the Diet During Diarrhea and the Practice of Restricting All Types of Food During Diarrhea (N=24)



When mothers were asked if they would feed the same foods to their children during severe and mild diarrhea, 54.7 % indicated that they would not feed the same foods, 43.8% would do the same, and 1.5% were uncertain (Table 9).

Table 9. Mother Who Would Feed the Same Types of Foods During Severe and Mild Diarrhea (N=203)

	N	%
YES	89	43.8
NO	111	54.7
UNCERTAIN	3	1.5

Of the participants who answered that they would not feed the same foods, 26 (23.4%) stated that they would stop all food if their child had severe diarrhea; however, none would do it in the case of mild diarrhea.

Table 10 presents the number of mothers who were using ORS during the diarrheal episode. The majority (95.6%) of the mothers were using some type of ORS, but what type of ORS was being used was not asked at the time of the interview.

Table 10. Distribution of Mothers Who Were Using ORS
(N=203)

Using ORS	N	%
YES	194	95.6
NO	9	4.4

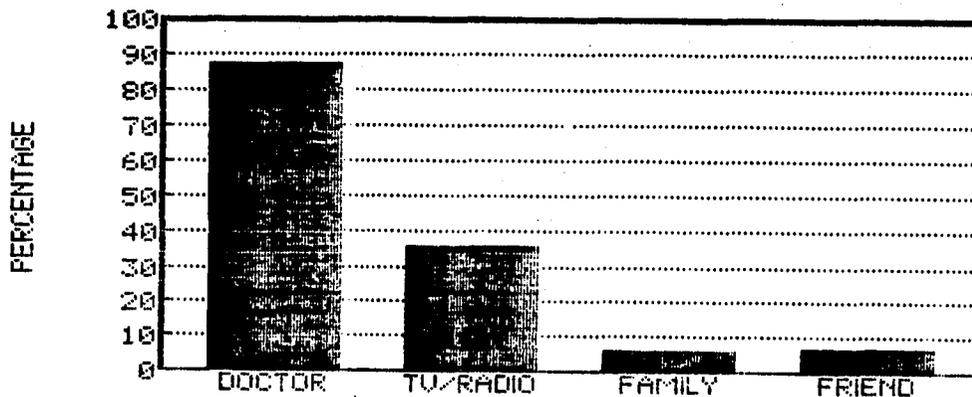
Of the mothers who were using ORS, 92.1% (189) stated that they would use it again in the future, 0.5% (1), 3.6% (7) would not use it again, and 0.5% (1) were uncertain. The reasons stated by 8 mothers who were either uncertain or answered no included: child's dislike (12.5%), "makes the child sicker" (37.5%), and "I don't believe on it" (50%) [Table 11].

Table 11. Reasons Why ORS Would Not Be Used Again (N=8)

Stated Reasons	N	%
Does not believe on it	4	50.0
Makes the child sick	3	37.5
Child dislikes it	1	12.5

As shown in Figure 18, 87.7% (178) of the mothers indicated have heard about or were advised to use ORS by the doctor, 36.0% through the radio and television, 6.4% from a relative, and 6.8% from friends. Multiple responses were allowed for this question.

Figure 18. Source of ORS Advice (N=203)



SUBJECTS' BELIEFS REGARDING DIARRHEA

Of the 203 respondents, 58% (118) believed that the way they were feeding their children was beneficial, whereas 42% (85) stated that they did not think the diet was being helpful (Table 12).

Table 12. Feeding Helped (N=203)

	N	%
YES	118	58.1
NO	85	41.9

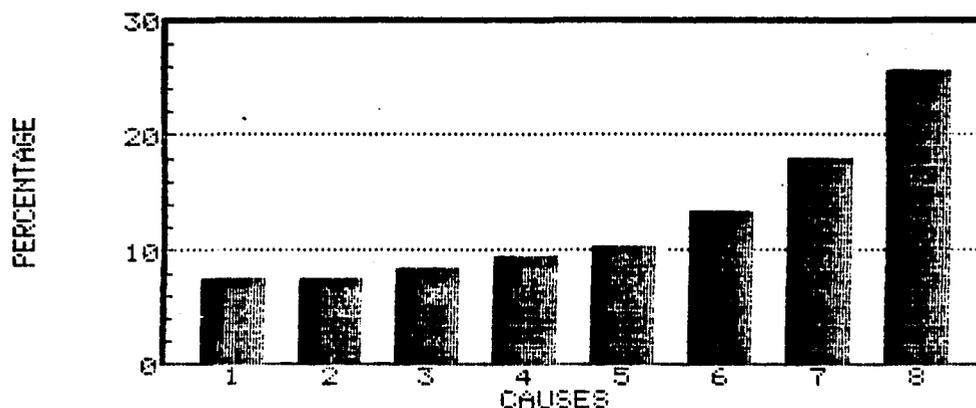
Responses to the question "Do you think that the way you are feeding your child (during diarrhea) is going to affect his/her growth" indicated that 92 (45.3%) of the mothers answered NO to the question (Table 13). Of these, 41 (44.5%) mothers had children that did not stay in the same feeding category they were before the diarrhea (see page 43). Six of the mothers who stopped all food during diarrhea indicated that they did not think the growth pattern of the child could be affected by a "few days" on the diet.

Table 13. Beliefs Regarding Feeding Practices and the Effect on Growth (N=203)

Effect on Growth	N	%
YES	111	54.7
NO	92	45.3

The distribution of the perceived causes of diarrhea indicated that 25.6% of the mothers did not know the cause of the diarrheal episode, 13% acknowledged teething, 10.3% heat, 9.4% change of milk, 8.4% infections, 7.4% food, 7.4% dehydration, and 18% other causes (Figure 19).

Figure 19. Perceived Causes of Diarrhea (N=203)



1- dehydration
2- food
3- infections

4- change of milk
5- heat
6- teething

7- others
8- unknown

As illustrated in Table 14 mother's level of education did not influence the most frequently perceived cause of diarrhea. Heat was the most common believed cause of diarrhea among mothers who attended to school between 4-6 years. Mothers who did not go to school or who went for 1-3 years acknowledged dehydration more often than the rest of the mothers. Twenty seven percent of the mothers who had completed elementary school indicated teething as the most frequent perceived cause of diarrhea.

TABLE 14. MOST FREQUENT PERCEIVED CAUSES OF DIARRHEA BY MOTHER'S EDUCATION (N=114)

YEARS	INFECTIONS		TEETHING		CHANGE OF MILK		HEAT		FOOD		DEHYDRATION	
	N	%	N	%	N	%	N	%	N	%	N	%
0 - 3	2	7.6	5	19.23	4	15.38	5	19.23	3	11.53	7	26.92
4 - 6	6	14.6	9	22	6	14.6	11	26.8	5	12.2	4	9.8
7 - 12	9	20.45	12	27.3	8	18.2	5	11.4	6	13.6	4	9.1
13 +			1	33.3	1	33.3			1	33.3		
	-----		-----		-----		-----		-----		-----	
	17		27		19		21		15		15	

The relationship between the perceived cause of the diarrheal episode and mother's age was not found to be statistically significant ($p. < 0.05$). Mothers who were less than 20 years old and those between the ages of 26-30 acknowledged heat as a perceived cause more frequently than the other mothers. Teething and change of milk were the most common answers of mothers who were 21-25 years and older than 31, respectively (Table 15).

TABLE 15. MOST FREQUENT PERCEIVED CAUSES OF DIARRHEA BY MOTHER'S AGE (N=114)

YEARS	INFECTIONS		TEETHING		CHANGE OF MILK		HEAT		FOOD		DEHYDRATION	
	N	%	N	%	N	%	N	%	N	%	N	%
20 OR <	3	10	7	23.3	3	10	8	26.7	5	16.7	4	13.3
21 - 25	8	17.4	13	28.8	6	13	7	15.2	5	10.8	7	15.2
26 - 30	3	15	3	15	3	15	5	25	3	15	3	15
31 OR >	3	16.7	4	22.2	7	38.9	1	5.5	2	11	1	5.5
	-----		-----		-----		-----		-----		-----	
	17		27		19		21		15		15	

On the other hand, the age of the child was significantly related to the perceived cause of the diarrheal disease ($p. < 0.05$). Forty seven percent of the mothers of infants less than 3 months old indicated that the cause of their children's diarrheal episode was due to change of milk. Children between 7 and 12 months and those older than 3 years were suffering diarrhea, according to their mothers, because of teething. Heat was the most commonly acknowledged cause in children between 4-6 months of age (Table 16).

TABLE 16. MOST FREQUENT PERCEIVED CAUSES OF DIARRHEA BY CHILD'S AGE (N=116)

MONTHS	INFECTIONS		TEETHING		CHANGE OF MILK		HEAT		FOOD		DEHYDRATION	
	N	%	N	%	N	%	N	%	N	%	N	%
2 - 3	1	5.9	0	0	8	47.1	5	29.4	1	5.9	2	11.8
4 - 6	4	12.9	3	9.7	4	12.9	12	38.7	4	12.9	4	12.9
7 - 9	5	23.8	11	52.4	1	4.8	1	4.8	1	4.8	4	25
10 - 12	4	25	5	31.3	1	6.3	1	6.3	1	6.3	4	25
13 - 24	3	11.5	6	23.1	5	19.2	2	7.7	7	26.9	3	11.5
25 +	0	0	2	66.7	0	0	0	0	1	33.3	0	0
	-----		-----		-----		-----		-----		-----	
	17		27		19		21		15		17	

Tables 17 and 18 show the children's reported incidence of diarrhea during the past month and 6 months. The diarrheal episode during which the interview was conducted was not included, therefore, zero times refers to those children who did not have a previous diarrhea during the past month or 6 months. Twenty eight children (13.8%) and 13 (6.4%) had constant diarrhea during the past 6 months and past month, respectively. One third of the children were experiencing their first diarrhea during the past 6 months at the time of the interview and 85.7% during the past month.

Table 17. Number of Diarrheic Episodes During the Past Month (N=203)

Number of Episodes	N	%
0	174	85.7
1	13	6.4
2	3	1.5
Constant	13	6.4

Table 18. Number of Diarrheic Episodes During the Past 6 Months (N=203)

Number of Episodes	N	%
0	76	37.4
1	45	22.2
2	23	11.3
3	20	9.8
4-7	8	3.9
8-10	3	1.5
Constant	28	13.8

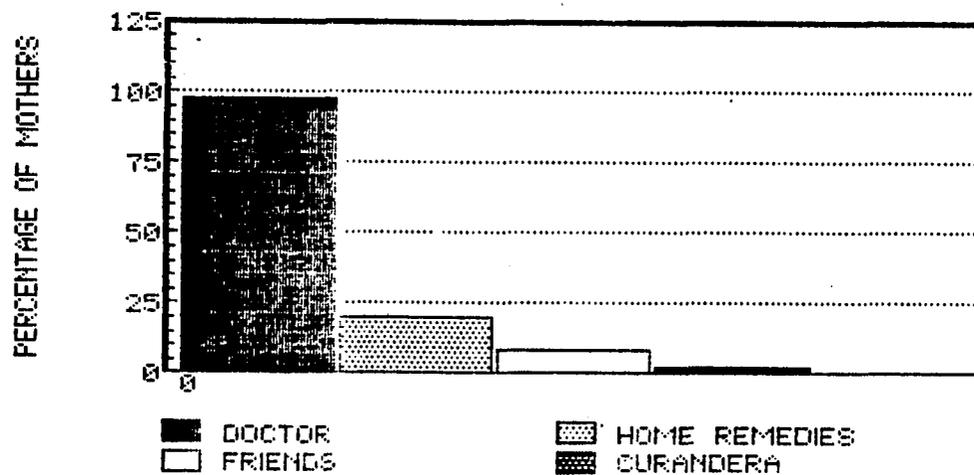
Of the mothers who stopped all food during diarrhea (24), 12.5% (3) of the children had had constant diarrhea during the past 6 months, 4.2% (1) eight times, 12.5% (3) two times, 25 (6) one time, and 45% (11) had not had diarrhea (Table 19). On the other hand, none of the children who had constant diarrhea during the past month were on an starvation diet, however, 8.3% (2) had three episodes, 87.5% (21) two episodes, and 4.2% (1) one episode.

Table 19. Mothers Who Restricted All Types of Food During Diarrhea and the Number of Diarrheic Episodes Suffered by their Children During the Past 6 Months (N=24)

Number of Episodes	N	%
0	11	45.8
1	6	25.0
2	3	12.5
10	1	4.2
Constant	3	12.5

For the question "If your child gets sick, to whom do you bring him/her or to whom do you ask for advice or treatment" multiple responses were allowed. According to the data, 98% (199) answered "the doctor", 20.2% (41) "home remedies", 8.9% (18) "friends/relatives", 2.0% (4) "curandera" (healer) (Figure 20).

Figure 20. Preferred Source of Health Advice and Treatment (N=203)



CHAPTER 5

DISCUSSION OF FINDINGS

The objective of the study was to discover beliefs that were held and practices which were followed by mothers when diarrhea occurred among Mexican children. This chapter presents the conclusions, comparison of the study findings with the literature, and recommendations for further research.

CONCLUSIONS

The Mexican culture, as most cultures, has developed a set of beliefs and practices concerning the etiology and treatment of diarrhea. Data from this study indicate that dietary modifications during diarrheal disease were frequently practiced by Mexican mothers. A significant percentage (86%) of the mothers reported that they had changed their child's usual diet during the diarrheal episode. Statistical analysis indicated that there was no relationship between the widespread practice of food restriction during diarrhea and the child's age and mother's education or age. Although the percentage of mothers withholding all food (11.8%) was not statistically significant by child's age, there was a trend for this

inappropriate practice to be prevalent for children who were less than 6 months of age (see Figure 10). About 40% of the children received during the diarrheic episode a diet that was equal to or very similar to their usual one.

Regardless of the age of the child, the dietary practices that were followed by mothers during the diarrheal episode were very similar. Breast feeding was continued by a significant number of mothers (75%). On the other hand, other milk was suspended in the diets of more than half of the children, although, the percentage varied depending on the age of the child. Other milk was more frequently omitted from the diet of the children who were 13 months and older. Eggs and cheese were the other food items that were often restricted whereas fruits/vegetables and breads were continued by most of the children (81%). These findings are consistent with other studies which have also found that milk is often restricted (Escobar et al, 1983; Real et al, 1982).

Rice water and corn/starch pudding were the traditional folk remedies used to treat diarrhea. A significant number of mothers stated using either one of these products or both. When mothers were asked if milk was being continued during the diarrheal disease, many times the answer was "no, but I am giving him/her rice water, corn, or starch pudding". It seemed that mothers believed that in some way

these products could be substitutes for milk during diarrhea and restriction of milk would not affect the nutritional status of the child. In the population studied, tea was not a popular home remedy as it is in other countries.

A significant percentage of mothers (95%) were using some type of ORS and would use it again. Escobar and co-workers (1983), in their study done in Peru, noted that only 40% of the mothers were using some type of ORS, although 67% thought it should be given. Likewise, Zoysa and co-workers (1984) in Zimbabwe found that only 5% of the mothers used ORS. The present research did not investigate what type of ORS was being used, but home-based ORS was very common among mothers from one of the hospitals because it was the type of solution being prescribed by the doctor, whereas mothers who attended the other hospital were usually able to obtain the WHO ORS packets.

In this study it was found that the inappropriate practices followed during diarrhea often resulted from the advice of a medical professional. Near 50% of the mothers received the advice for the dietary management from the doctor and more than half of the mothers who restricted all food during the diarrheal episode were advised by the doctor. It is important to note, though, that not all of the mothers were exclusively following the doctors' instructions but often utilized a combination of their own

experience with the advice of medical professional. Kumar and co-workers (1985) noted in their study that the practice of restricting food during diarrhea was advised by health workers and elders. Also they suggested that mothers feel that intensity of diarrhea decreases on food restriction.

Teething and heat were thought to be the most common causes of the diarrheal episode. These findings are consistent with other studies conducted in other countries which also found that these two conditions were the most common perceived causes of diarrhea (Maina-Ahlberg, 1979; Real et al, 1982; Kumar et al, 1985; Escobar et al, 1983; Zoysa et al, 1984; Nations, 1982; Lazzof et al, 1975). In the present study it was not determined if the perceived cause of diarrhea had an effect on the dietary practices followed during the episode. However, child's age had a significant effect on the perceived cause of the disease (see Table 16). Regarding the significance of this variable, it is important to consider that the perceived causes of diarrhea may be related to the stage of development of the child rather than the specific age. For example, teething would not be seen as the perceived cause of the diarrheal episode in a child who is 2 months of age, but it may be related to other causes which are related to the stage of development of the child, such as change of milk. Mother's age and education were not significantly correlated with what

mothers believed to be the cause of the illness. Zoysa and co-workers (1984), in their study, also found that the respondent's age, educational status, and degree of participation in community activities did not influence the beliefs about disease causation.

Of the mothers who changed their children's diet and answered that they did not believe that the dietary modifications could affect the growth of the child, 44.5% of the children did not stay in the same feeding category they occupied before the disease (see page 43).

The perceived seriousness of the diarrheal episode had a significant effect on the dietary management of the disease. During severe diarrhea, mothers' answers indicated that they would follow more extreme withholding of food practices than if the child had mild diarrhea.

In spite of the fact that several of the practices are based mainly on personal experience and home remedies, modern medicine seems to be popular among Mexican mothers. Almost all the mothers indicated that they would visit a doctor if their children were sick; however, one has to consider that there is a bias in the population since all the interviews were obtained from mothers who were visiting a doctor for the treatment of a disease.

In conclusion, health education programs regarding the treatment of diarrhea should be provided to mothers to

prevent the serious nutritional complication of the overwhelming preference of dietary modifications during diarrhea. Emphasis should be put on decreasing the percentage of mothers restricting milk during diarrhea at an age when milk is the most important food and when diarrheal diseases are more common. This study highlights the need for disentangling the beliefs of medical professionals in order to understand the local beliefs, as well; therefore, more attention should be given to the identification of doctor's beliefs and practices.

RECOMMENDATIONS

Several recommendations are made for future research based on this study.

They include the following:

1. Replicate the study using a randomly selected sample.
2. Examine correlations between other major variables such as perceived causes of diarrhea and practices, ORT knowledge, perceived seriousness of the disease, and action taken.
3. Replicate the study for a group of subjects from other states in Mexico.

APPENDIX A
SUBJECT QUESTIONNAIRE FORM

DATE _____
 NAME OF CHILD _____ NAME OF MOTHER _____
 BIRTH DATE _____ AGE: YEARS _____
 AGE _____ MONTHS _____ HOSPITAL _____
 SEX : F _____ M _____

Code: 1-YES 2-NO 3-INCREASED 4-DECREASED 5- STARTED
 6-DON'T KNOW/REMEMBER 7- STOPPED

1. WHAT WAS THE CHILD'S USUAL DIET BEFORE HE/SHE GOT DIARRHEA: WERE YOU GIVING HER/HIM ?

- | | |
|----------------------------|-------------------------------------|
| 1. breast milk _____ | 6. tortilla/beans/pastas/rice _____ |
| 2. other milk _____ | 7. potatoes _____ |
| 3. cereal _____ | 8. meat/chicken/fish _____ |
| 4. fruits/vegetables _____ | 9. eggs _____ |
| 5. beans _____ | 10. cheese _____ |
| | 11. others _____ |

2. HAVE YOU OR DID YOU CHANGE THIS FEEDING PATTERN SINCE YOUR CHILD GOT DIARRHEA? _____

IF YES:

A) What did you change?

- | | |
|---------------------------|--|
| 1. stopped all food _____ | 8. starch/corn pudding _____ |
| 2. water _____ | 9. tortillas/beans/ pastas/ rice _____ |
| 3. cereal _____ | 10. fruits/vegetables _____ |
| 4. tea _____ | 11. eggs _____ |
| 5. breast milk _____ | 12. meat/chicken/fish _____ |
| 6. other milk _____ | 13. cheese _____ |
| 7. rice water _____ | 14. beans _____ |
| | 15. others _____ |

B) For how many days have you been feeding your child in this way:

- | |
|----------------------|
| 1. 0-3 days _____ |
| 2. 4-6 days _____ |
| 3. more than 6 _____ |

3. WHO GAVE YOU THE ADVICE ?

- | | | |
|--------------------------|--------------------|-------------------------|
| 1. doctor _____ | 3. relative _____ | 5. own experience _____ |
| 2. friend/neighbor _____ | 4. curandera _____ | 6. other _____ |

4. DO YOU THINK THAT THIS WAY OF FEEDING YOUR CHILD WAS/IS HELPING HIM/HER ? _____

5. DO YOU THINK THAT THE WAY YOU HAVE BEEN FEEDING OR FED YOUR CHILD SINCE HE/SHE GOT DIARRHEA WOULD AFFECT HIS/HER GROWTH? ____

6. WHY DO YOU THINK YOUR CHILD GOT DIARRHEA :

- | | |
|------------------------|----------------------------|
| 1. water ____ | 6. overfeeding ____ |
| 2. infection ____ | 7. don't know ____ |
| 3. teething ____ | 8. fallen fontanelle ____ |
| 4. caused by food ____ | 9. somebody caused it ____ |
| 5. change of milk ____ | 10. others ____ |

7. WILL YOU FEED YOUR CHILD IN THE SAME WAY IF SHE/HE HAS SEVERE OR MILD DIARRHEA ? ____

If the answer is no:

A) If the child has severe diarrhea, what would you give

- | | |
|-----------------------------|------------------------------------|
| 1. stop all food ____ | 9. tortilla/bread/pastas/rice ____ |
| 2. water ____ | 10. fruits and vegetables ____ |
| 3. cereal ____ | 11. eggs ____ |
| 4. tea ____ | 12. meat/chicken ____ |
| 5. breast milk ____ | 13. cheese ____ |
| 6. other milk ____ | 14. beans ____ |
| 7. rice water ____ | 15. others ____ |
| 8. starch/corn pudding ____ | |

B) If the child has mild diarrhea, what would you give

- | | |
|-----------------------------|------------------------------------|
| 1. stop all food ____ | 9. tortilla/bread/pastas/rice ____ |
| 2. water ____ | 10. fruits and vegetables ____ |
| 3. cereal ____ | 11. eggs ____ |
| 4. tea ____ | 12. meat/chicken/fish ____ |
| 5. breast milk ____ | 13. cheese ____ |
| 6. other milk ____ | 14. beans ____ |
| 7. rice water ____ | 15. others ____ |
| 8. starch/corn pudding ____ | |

8. HAS SOMEBODY TELL YOU OR HAVE YOU HEAR ABOUT ORT ____

If yes:

A) WHO OR FROM WHERE

- | | | |
|-----------------------|-------------------------|---------------|
| 1. doctor ____ | 4. friend/neighbor ____ | 7. other ____ |
| 2. social worker ____ | 5. tv/radio ____ | |
| 3. relative ____ | 6. pharmacy worker ____ | |

B) ARE YOU USING ORS ____

If yes:

a) Will you use it again? ____

If no:

a) why not _____

9. HOW MANY TIMES YOUR CHILD HAD DIARRHEA IN THE PAST 6 MONTHS ____ ; IN THE LAST MONTH ____

10. HAS YOUR CHILD BEEN HOSPITALIZED BECAUSE OF DIARRHEA ____

11. IF YOUR CHILD GETS SICK, TO WHOM WOULD YOU BRING HIM/HER OR TO WHOM WOULD YOU ASK FOR ADVICE OR TREATMENT?

1. friend/neighbor/relative ____
2. doctor ____
3. curandera ____
4. home remedies ____
5. other ____

GENERAL INFORMATION

12. How many children do you have? ____

13. Do you know how to write and read ____

14. Up to what year did you go to school ____

15. Do you work ____

13. What type of job your husband does _____

a) how much he makes every 15 days

- | | |
|------------------------|--------------------------|
| 1. <13,800 _____ | 5. 84,000-126,000 _____ |
| 2. 13,800-27600 _____ | 6. 126,000-252,000 _____ |
| 3. 27,600-42,000 _____ | 7. > 252,000 _____ |
| 4. 42,000-84,000 _____ | |

14. Do you have:

- | | |
|-----------------------|----------------|
| 1. electricity _____ | 4. stove _____ |
| 2. tap water _____ | 5. radio _____ |
| 3. refrigerator _____ | 6. tv _____ |

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