

A STUDY OF MATERNAL KNOWLEDGE, ATTITUDES AND PRACTICES
REGARDING DIARRHOEAL DISEASE IN THEIR CHILDREN
PRESENTING AT KENYATTA NATIONAL HOSPITAL

BY A. R. TAILOR.

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of Master of Medicine (paediatrics) of the University
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DECLARATION

I declare this paper is my original work and has not been submitted for university degree in another University.

A. R. Tailor Signature

Dr. A. R. Tailor

This dissertation has been submitted to the University of Nairobi with my approval as University Supervisor.

A. J. E. Alwar Signature

Dr. A. J. E. Alwar

Dept. of Paediatrics

J. Kagia Signature

Prof. J. Kagia

Dept. of Community Health

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AIM : -

To determine the knowledge, attitudes and practices of mothers regarding diarrhoea and its consequences.

SPECIFIC OBJECTIVES:-

- (A) To relate knowledge, attitudes and practices about diarrhoeal disease to age, parity and level of education of mothers.
- (B) To determine the type of fluids and food given to the children during an attack of diarrhoea.
- (C) To determine the source of knowledge about diarrhoeal disease.

LIST OF ABBREVIATIONS

- ADM -Anti-diarrhoeal mixture.
ASA -Aspirin.
BF -Breast-feeding.
DF -Degree of freedom.
KAP -Knowledge, attitudes and practice.
KCC -Kenya cooperative creamaries.
KNH -Kenyatta National Hospital.
ORS -Oral rehydration solution.
SSS -Salt and sugar solution.
UJI -Maize meal porridge.
UNICEF -United Nations Childrens Fund.
W.H.O. -World Health Organisation.

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SUMMARY

Acute diarrhoeal disease in children is a major public health problem. The World Health Organisation has initiated Global diarrhoeal disease control programmes aimed at reducing diarrhoea related morbidity, mortality and malnutrition. Mothers play and will continue to play a central role in implementation of these programmes. Mothers' knowledge, attitudes and practice regarding diarrhoea will determine the success of any diarrhoeal disease control programme.

Beginning May 1987 to December 1987, a study was conducted at the Paediatric filter clinic, Kenyatta National Hospital to determine mother's knowledge, attitudes and practices regarding diarrhoea. A total of 215 mothers were interviewed by the author using a structured questionnaire (appendix 35).

Results show that 74.9% of all mothers interviewed were between ages 20 - 29 years. Regarding level of education 59.1% of the mothers had primary education and 22.3% of the mothers had secondary education. 54% of the interviewed mothers had less than 3 children. 49.8% of the mothers came from Kibera, Mathare and Kariobangi which are predominantly areas where the low income groups reside in Nairobi.

Of the children who had diarrhoea 93.6% were between 5 - 19 months of age. 66.5% of all patients presented within 4 days of onset of diarrhoea. 57.7% of these children had moderate dehydration and 6% had severe

dehydration on presentation. Of the children between 5 - 19 months, 72.9% were being breastfed. Regarding knowledge of causes of diarrhoea, 46.5% of mothers said they did not know any causes of diarrhoea. Regarding feeding during diarrhoea, 99% of mothers said they would continue feeding their children and in practice 99% of mothers continued feeding their children. Among the mothers who said they would continue feeding, 82.7% of mothers breastfed their children during diarrhoeal illness. Among those who prepared a special food for their children with diarrhoea, 33% of mothers administered bananas.

Regarding fluids, 99% of mothers said they would administer fluids during diarrhoea; in practice, 99% administered fluids. Among the mothers who administered fluids, 74.1% of mothers knew about use of salt sugar solution and in practice 68.8% utilised it but salt, sugar and water were inappropriately mixed. Of all mothers, 69.8% had heard of ORS but only 11.1% utilised ORS during diarrhoea.

Regarding death during diarrhoea, 91.3% of mothers are aware that diarrhoea may cause death and of these 59.5% knew that dehydration is the cause of death during diarrhoea. Only 42.7% of mothers knew at least two signs of dehydration, while 38.5% of mothers did not know any signs of dehydration.

Health facilities and schools were major sources of knowledge regarding diarrhoea accounting for 81.1% and 6% respectively.

Regarding attitude whether diarrhoea can be prevented, 63.3% of mothers believed that diarrhoea can be prevented. The proportion of mothers who believed that dehydration can be prevented is 95.8% and of these 96.1% believed oral fluids administration would prevent dehydration.

Mothers level of education was positively and significantly associated with increased knowledge about causes of diarrhoea, and increased knowledge of signs of dehydration. Increased level of education was also associated with belief that diarrhoea can be prevented and with knowledge of methods of diarrhoea prevention.

Increasing maternal age, parity and level of education were positively associated with belief that diarrhoea can be managed by oral fluids alone.

Increasing parity was associated with increased breastfeeding and continued feeding during diarrhoea.

Rehydration Solution) (6,10). Oral rehydration therapy can be administered by health auxiliaries and mothers at an early stage of illness, thus reducing risk of severe and fatal dehydration. In health centres and hospitals, it can largely replace intravenous therapy and greatly reduce the need for costly intravenous fluids, thus doing away with the need for skilled personnel to administer the intravenous fluids (6,10). Kinoti et al (11) found that 84.1% of all in-patients admitted to Kenyatta National Hospital due to diarrhoeal illness with mild to moderate dehydration could be successfully treated with oral rehydration therapy.

When a child has diarrhoea, it has been shown that oral rehydration with education on proper feeding practices leads to earlier improvement of appetite and better weight gain (6). These proper feeding practices include continuation of breastfeeding, giving the usual foods during diarrhoea, and increasing the amount of food given during convalescence. More-over feeding provides glucose, peptides and amino-acids that have been shown to enhance water and electrolyte absorption in addition to preventing protein energy malnutrition (6).

Oral rehydration therapy will eventually become mother's responsibility with administration of home-based solutions. It is known that more than 80% of all diarrhoeal illnesses are short-lived and self-limiting (1,9).

Therefore mothers would be expected to prepare and administer oral rehydration fluids at home to their children with subsequent less dependence on formal health services. This is one of the strategies of diarrhoeal disease control programme (I,I2). More than 95% of the developing world's population now live in countries that have control of diarrhoeal diseases programme (I2). In a few countries diarrhoeal mortality has already been reduced by 40 - 50% by widespread implementation of oral rehydration therapy (I2).

Breastfeeding has been shown to protect against diarrhoeal diseases. This protection has been shown to be effective irrespective of level of hygiene. Studies show that middle and upper socio-economic class children on bottle milk have higher incidence of diarrhoea as compared to breastfed children of lower socio-economic class (I3). More-over breastfed infants have better nutritional status and therefore decreased risk of death from diarrhoea. Theoretical calculations show that promotion of breastfeeding can reduce diarrhoeal morbidity rates by 8 - 20% and diarrhoea mortality rates by 24 - 27% in the first six months of life (I3). More-over, when infants developed diarrhoea fewer breastfed infants required intravenous therapy and fewer were admitted as in-patients (I3).

Most of the pathogenic organisms that cause diarrhoea are transmitted primarily by the faeco-oral route. Transmission may be direct or indirect through water and food. Transmission of pathogens can be interrupted by improved hygiene and improved facilities such as

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better water supplies and latrines. Health Education has been shown to be effective in improving recognition and treatment of diarrhoea, improving excreta disposal, improving hand-washing, breastfeeding, food hygiene and care of drinking water. Promotion of the above measures has been found to reduce incidence of diarrhoea by 14 - 48% in various studies (14).

Maternal KAP regarding diarrhoea would probably be influenced by age, parity and level of education. Maternal age was not shown to significantly influence knowledge about diarrhoea in a New Zealand study (15). Maternal parity may influence maternal KAP regarding diarrhoea assuming that mothers gain experience in the upbringing of their children. Therefore we would expect primiparous mothers to have deficient KAP regarding diarrhoea compared to multiparous mothers. Educated mothers would be expected to have better KAP regarding diarrhoea. Low educational levels of mothers have been shown to positively correlate with increased diarrhoea rates. (14, 15). Studies in Bangladesh (16) have shown that families with no formal education had 1.7 times higher incidence of non-cholera diarrhoea and a 1.8 - 3.4 times higher incidence of cholera, than families with at least one member who was a high school graduate. Maternal KAP regarding diarrhoea vary in different areas of the world. There are no published data regarding maternal KAP to diarrhoea in Kenya. This prompted the author to carry out this study.

MATERIALS AND METHODS

The study was conducted from May to December, 1987 at Kenyatta National Hospital. This is a National referral and teaching hospital but it also serves as a district hospital for residents of Nairobi.

Children attending this hospital are first seen at the Paediatric filter clinic which has a diarrhoea treatment centre.

The instrument of the study was a prestructured questionnaire (appendix 3B). Mothers were interviewed by the author in Kiswahili or English depending on the language they felt they were proficient in. The answers were recorded onto the questionnaire.

The questionnaire had been translated from English to Swahili and from Kiswahili to English by two independent people to ensure reproducibility and improve the quality of the questionnaire.

The questionnaire was initially pre-tested to improve the quality mainly with regard to range of possible answers, rewording of questions and also to ensure that the responses were objective.

Mothers whose children presented with acute diarrhoeal illness as a major complaint to the Paediatric Filter Clinic formed the study cases. The first three mothers seen at the Diarrhoea Treatment centre from Monday to Friday and who satisfied the inclusion criteria were included in the study.

INCLUSION CRITERIA

- (1) Mothers whose children were less than two years old and presented with acute diarrhoea as a major complaint.
- (2) Acute diarrhoea was defined as diarrhoea of less than two weeks duration with passage of three or more watery stools in previous 24 hours for the purposes of this study.
- (3) Mothers who consented to participate in the study.

EXCLUSION CRITERIA

- (1) Guardians other than the mother who normally look after these children were not included, for example, maids, older siblings, aunts, neighbours and father.
- (2) Mothers of children with frank malnutrition were excluded from the study.

Sample size.

Calculation of the minimum sample size was based on the assumption that 5% of all patients seen at Paediatric Filter Clinic would have diarrhoea as a major complaint. This gives proportion of case $P = 0.05$. The desired level of precision was 5% giving a C value of 0.05.

The corresponding 95% confidence interval value of $Z_{\alpha} = 1.96$

The power of achieving the specified significant difference was taken as 90%: $Z_{\beta} = 1.28$

Minimum sample size required is:

$$n = \frac{(Z_{\alpha} + Z_{\beta})^2 \times P(1-P)}{C^2}$$
$$= \frac{(1.96 + 1.28)^2 \times 0.05 \times 0.95}{0.05^2}$$

\approx 200 cases.

RESULTS

(A) MOTHER'S BACKGROUND DATA

(I) Distribution of mothers by age

FIGURE I

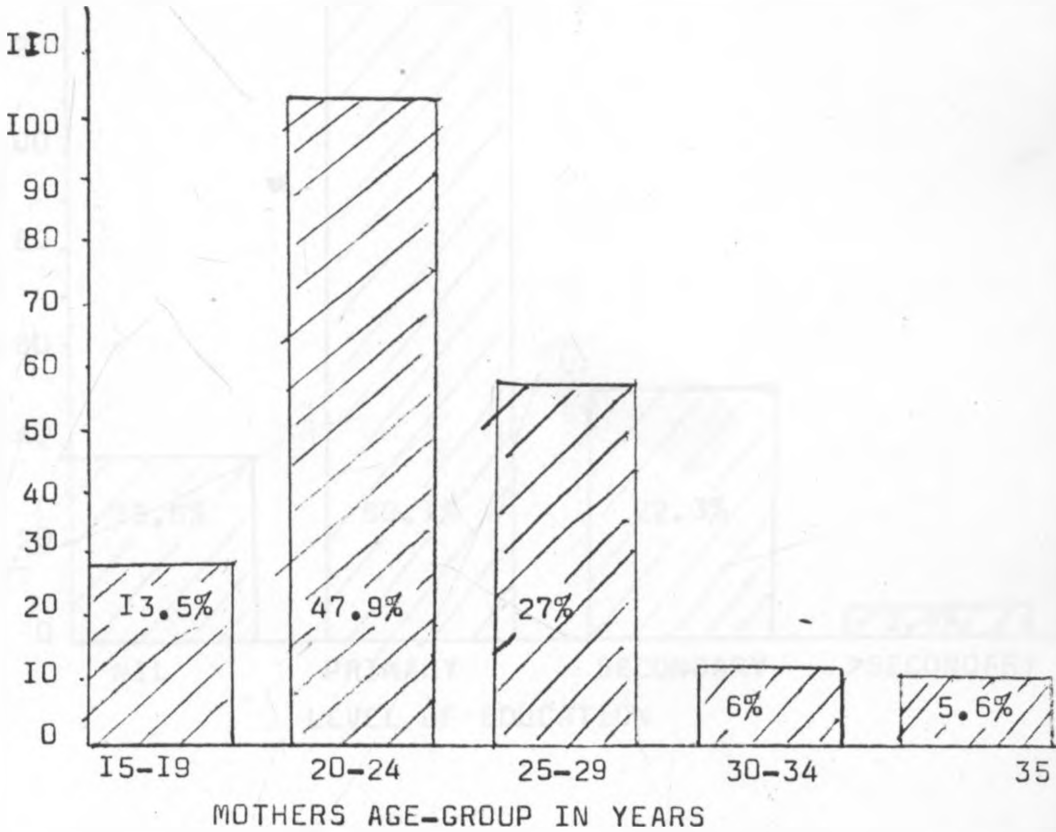


Figure I shows that the majority of mothers fall between age 20-29 years accounting for 74.9% of all mothers.

(2) Distribution of mothers by level of education

FIGURE 2

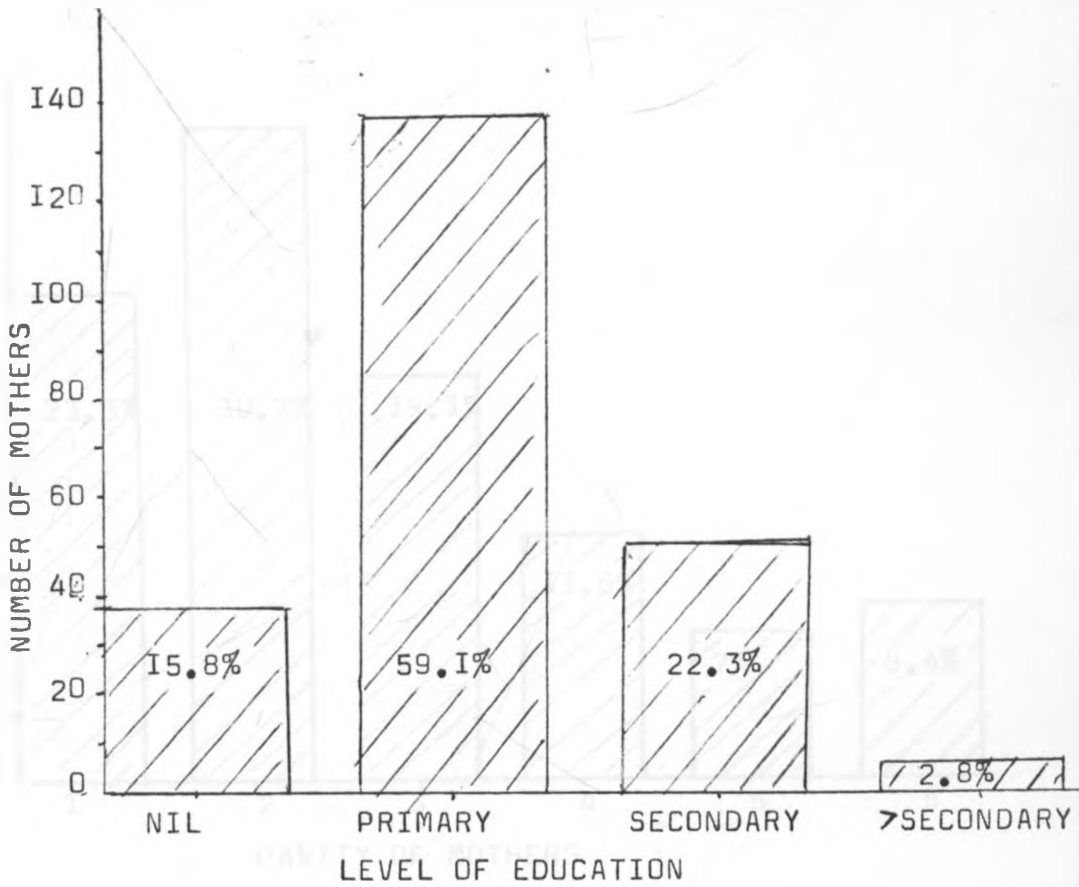


Figure 2 shows that 84.2% of mothers had attained some education.

(3) The distribution of mothers by parity

FIGURE 3

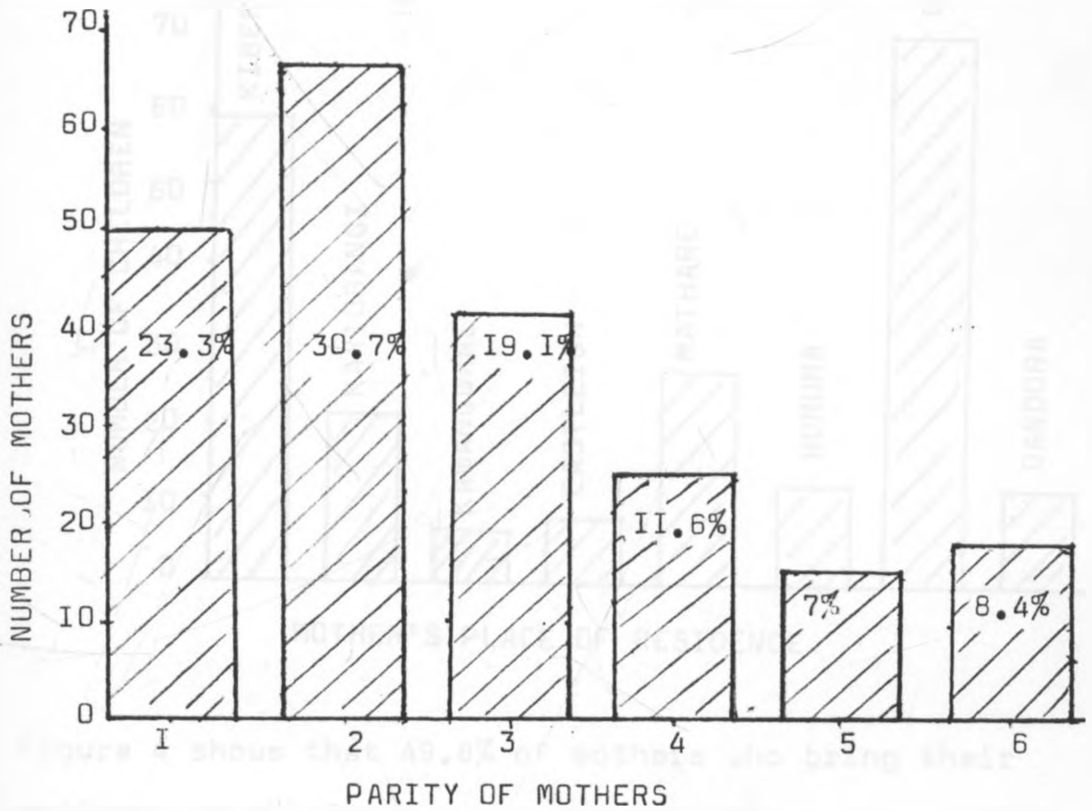


Figure 3 shows that 73.1% of mothers had less than four children.

(4) Distribution of mothers by area of residence

FIGURE 4

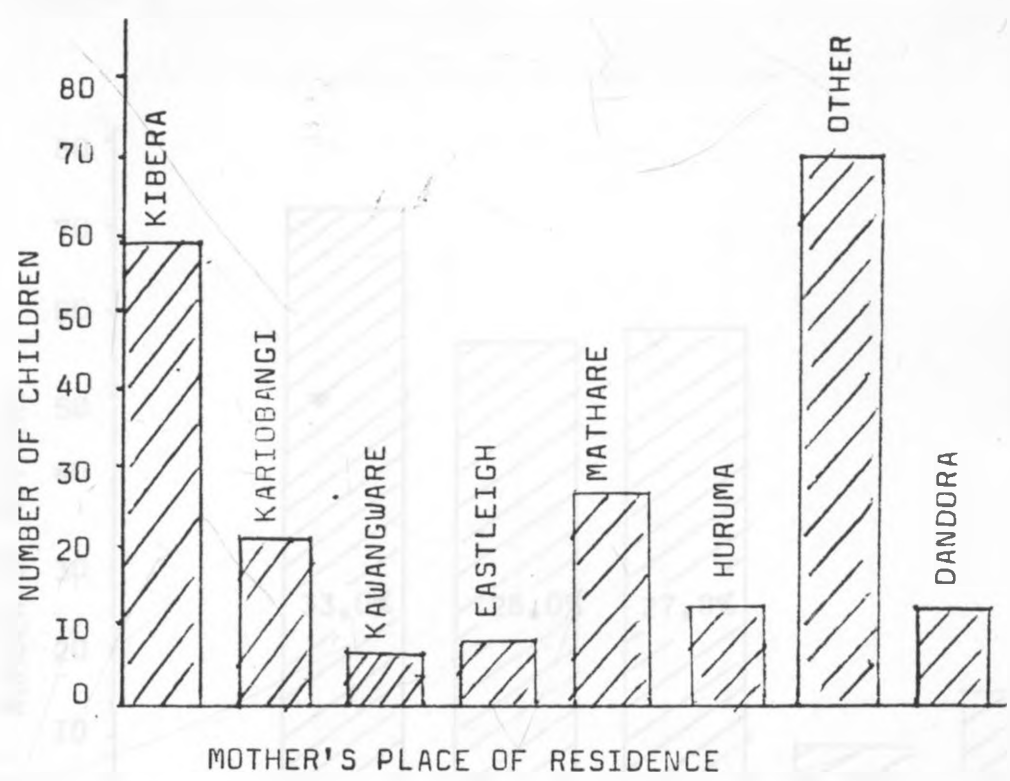
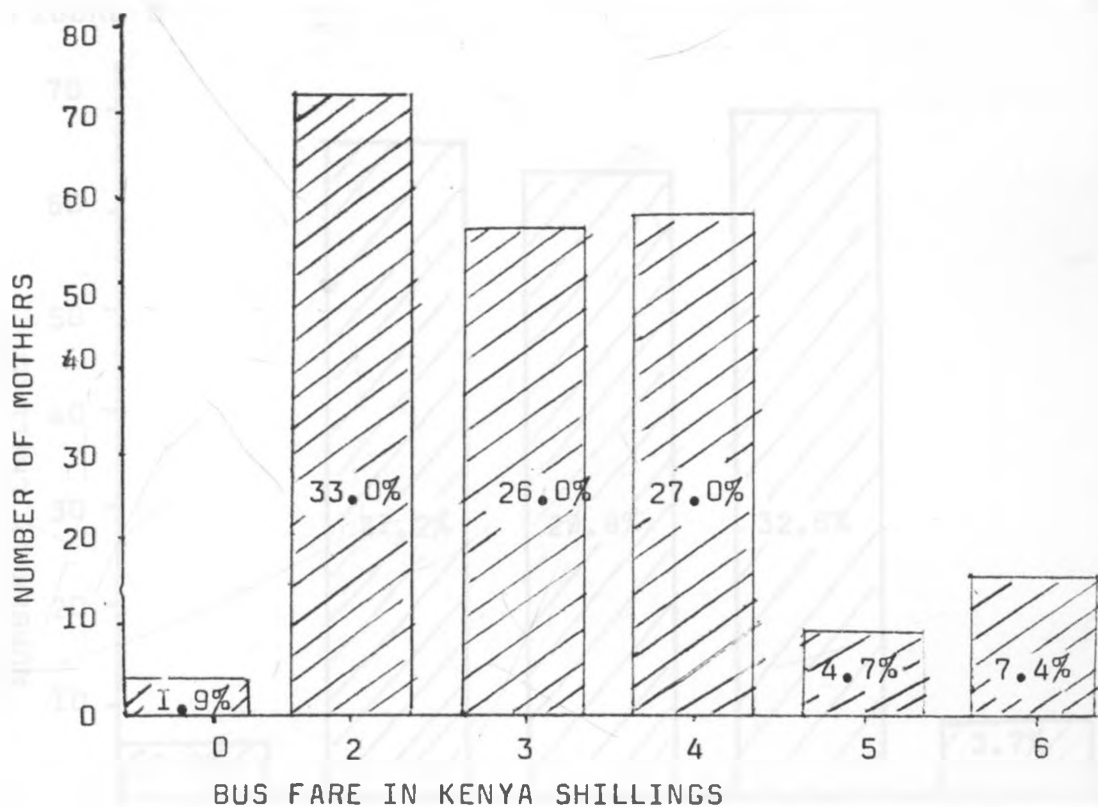


Figure 4 shows that 49.8% of mothers who bring their children to KNH for management of diarrhoea come from Kibera, Mathare and Kariobangi which are areas of Nairobi in which low income groups normally reside in. Other areas of residence included Jericho, Kenyatta Estate, Uthiru, Ongata Rongai, Riruta etc.

(5) Distribution of mothers by bus fare

FIGURE 5

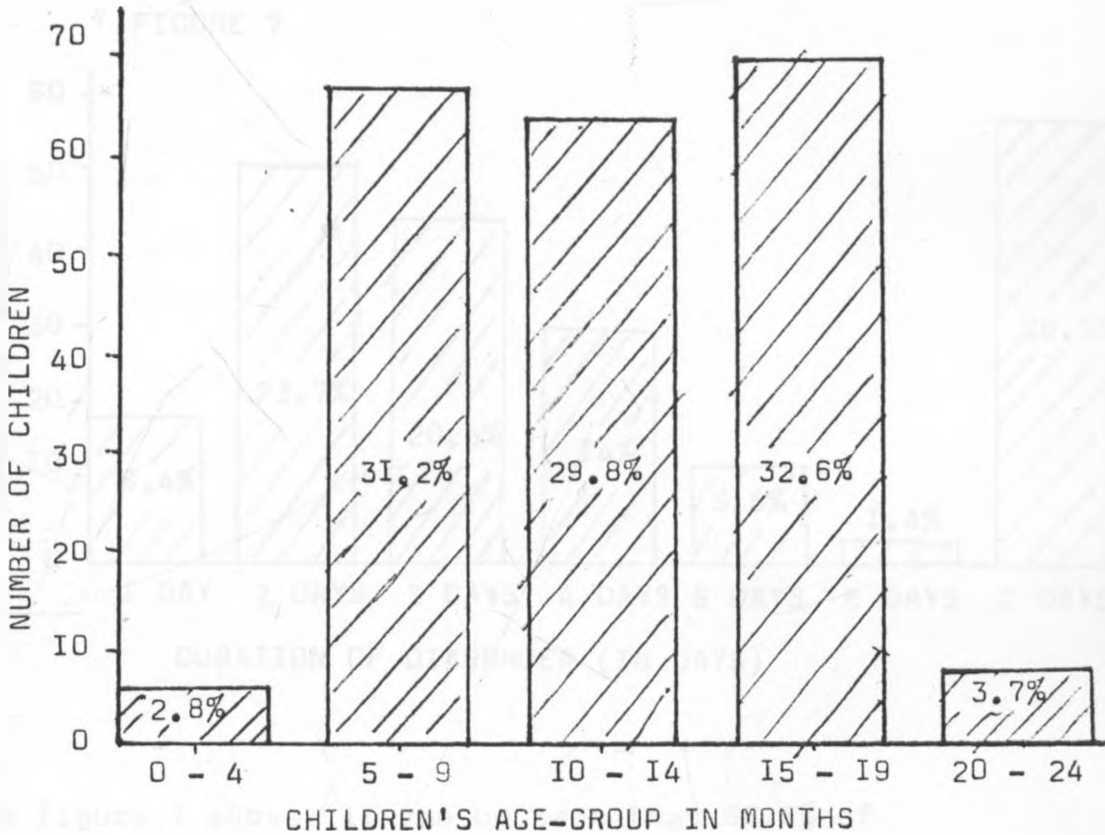


From figure 5 above, it can be seen that 86% of the mothers spend between 2 and 4 shillings to reach Kenyatta National Hospital and have to spend the same amount of money to return home after their child has been seen.

(B) CHILDREN'S BACKGROUND DATA

(6) Distribution of children by age in months

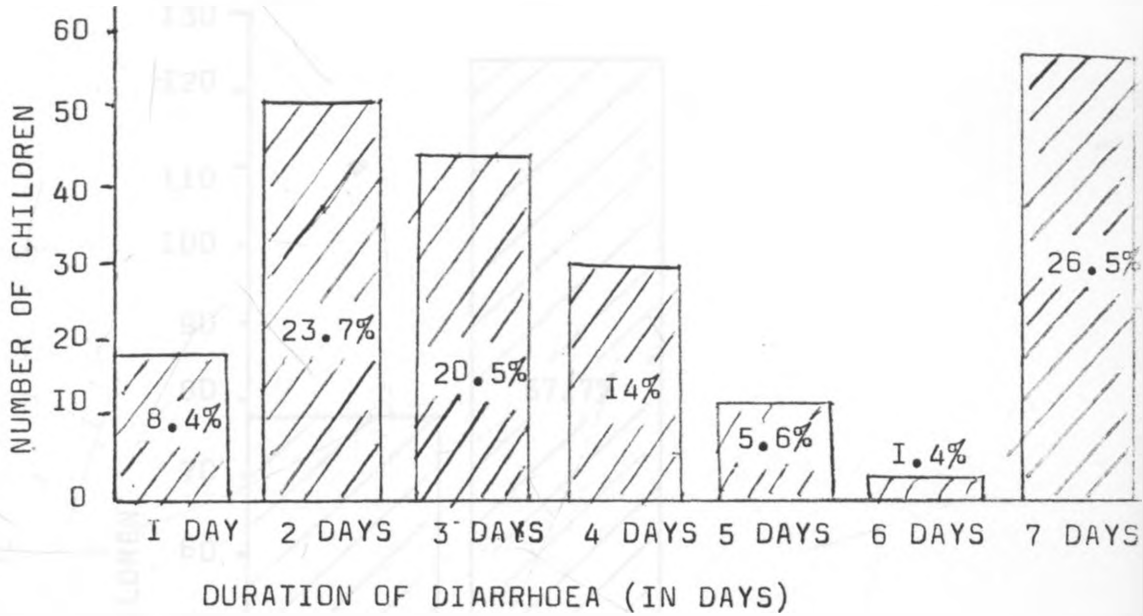
FIGURE 6



From figure 6 above, it can be seen that the most common age for diarrhoea is between 5 months and 19 months, accounting for 93.6% of patients.

(7) Distribution of children by duration of diarrhoea in days.

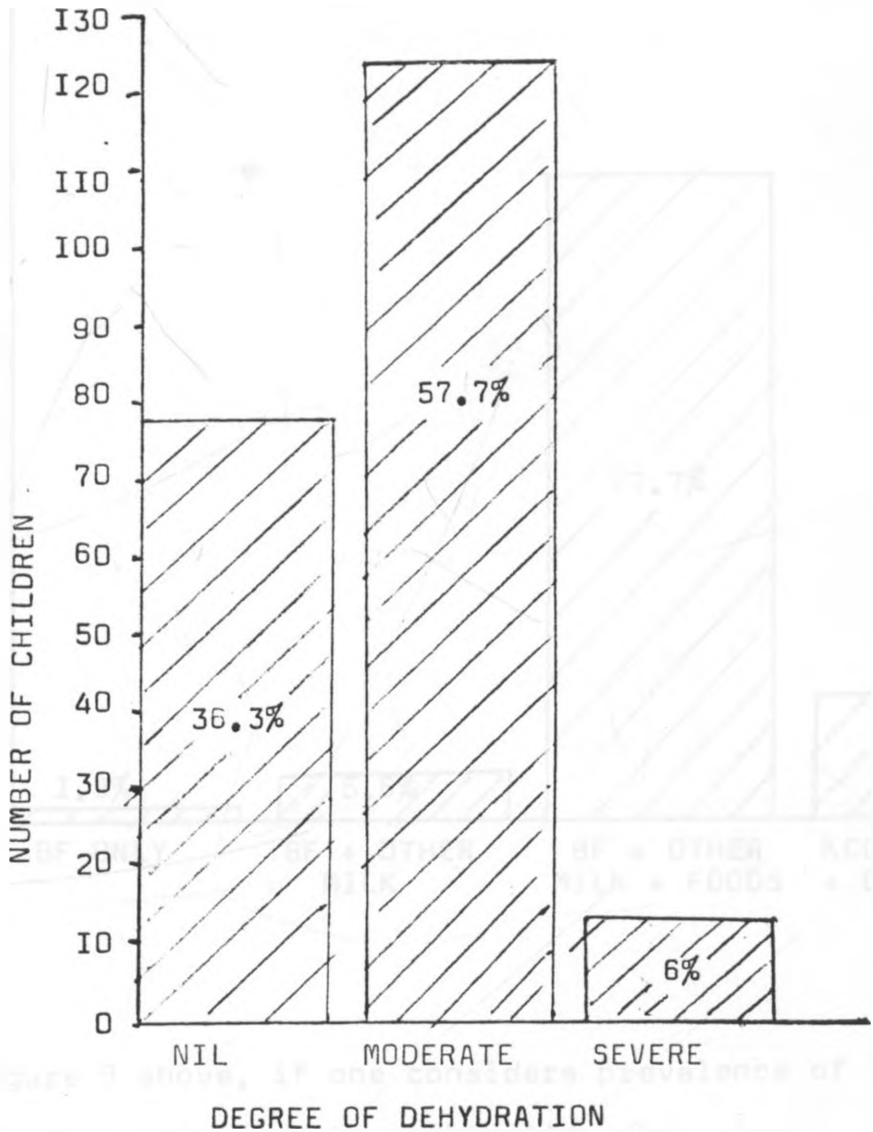
FIGURE 7



From figure 7 above, it can be seen that 66.5% of patients presented within 4 days of onset of diarrhoea.

(8) Distribution of children by degree of dehydration.

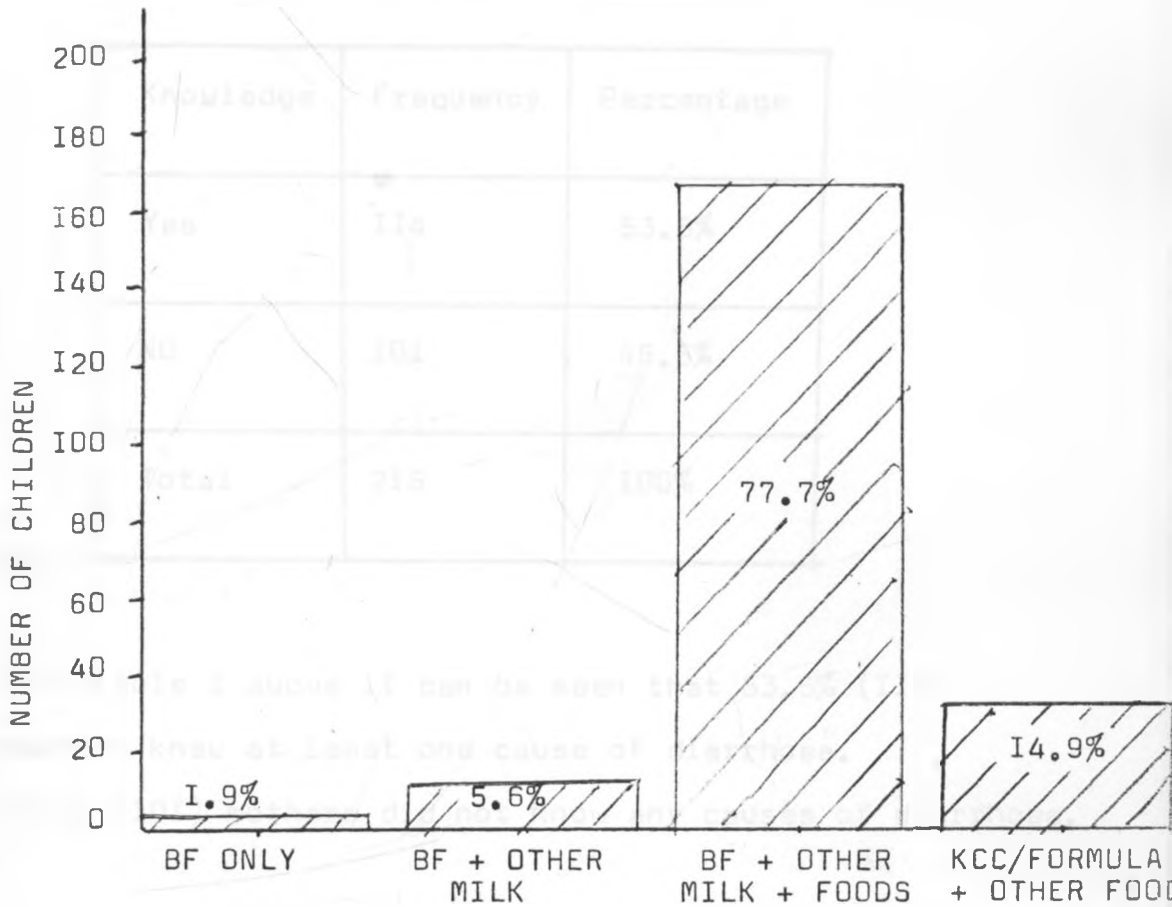
FIGURE 8



From figure 8 above, it can be seen that 63.7% of patients had signs of dehydration when they presented at KNH.

(9) Method of feeding within the last one month prior to onset of diarrhoea.

FIGURE 9



From Figure 9 above, if one considers prevalence of breastfeeding alone and in combination with other foods then 85.1% of patients were being breastfed.

(C) MOTHER'S KNOWLEDGE REGARDING DIARRHOEA

(IO) Mother's knowledge regarding causes of diarrhoea

TABLE I

Knowledge	Frequency	Percentage
Yes	114	53.5%
NO	101	46.5%
Total	215	100%

From table I above it can be seen that 53.5% (114) mothers knew at least one cause of diarrhoea. 46.5% (101) mothers did not know any causes of diarrhoea.

2
3

(II) Distribution of knowledge regarding causes of diarrhoea

FIGURE 10

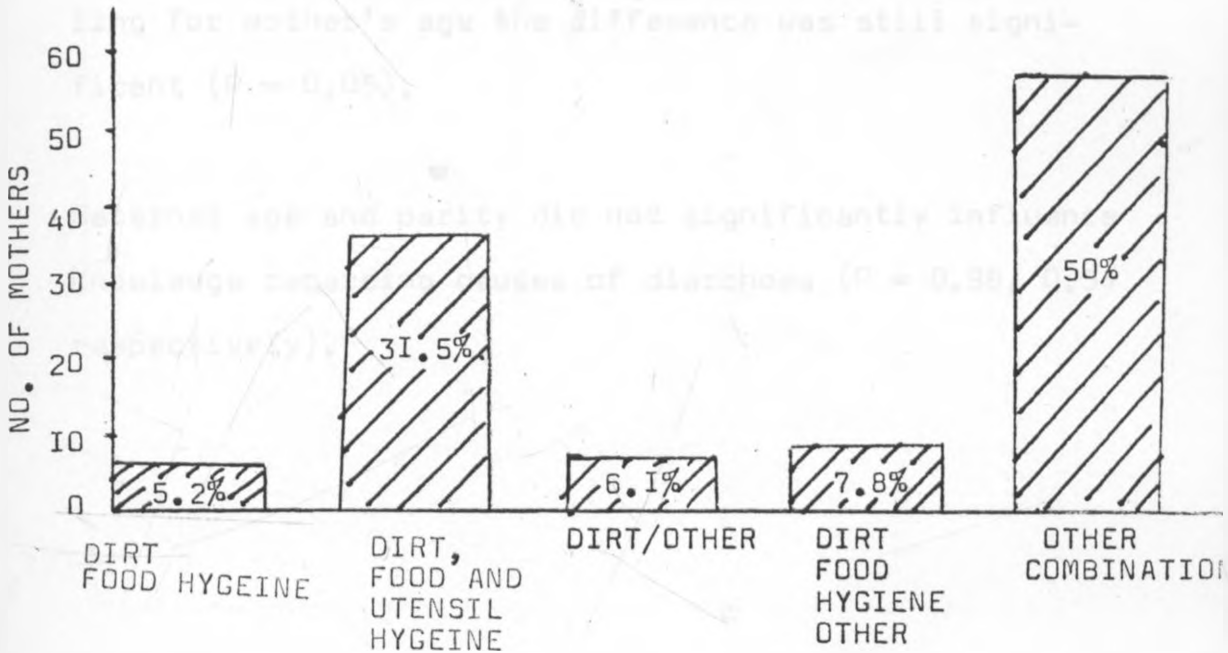


Figure 10 shows some of the factors identified by mothers as causes of diarrhoea. If one considers knowledge about dirt alone, then 68.4% of mothers associated dirt with causation of diarrhoea. Other combinations included mainly dirt, lack of food and utensil hygiene.

The relationship between knowledge of causes of diarrhoea and maternal age, parity and level of education were tested (appendix 1, 2, 3 respectively).

There was significant difference between mothers in different categories of education with regard to their knowledge of causes of diarrhoea. Increasing level of education was associated with knowledge of causes of diarrhoea ($P = 0.01$). When this was tested controlling for mother's age the difference was still significant ($P = 0.05$).

Maternal age and parity did not significantly influence knowledge regarding causes of diarrhoea ($P = 0.98, 0.34$ respectively).

(I2) Distribution of mother's knowledge regarding feeding during diarrhoea

TABLE II

Knowledge	Frequency	Percentage
Stop breast-feeding & other foods	2	0.9%
Continue breast-feed but stop other foods	13	6.0%
Continue breast-feed & other foods	200	93%
TOTAL	215	100%

Table II above shows that 93% of mothers said they would continue breastfeeding and other foods during diarrhoea in their children. Only 0.9% of mothers said they would stop breastfeeding and other foods during diarrhoea.

When mother's knowledge regarding feeding during diarrhoea was tested by

- (i) mother's age (appendix 4)
- (ii) mother's parity (appendix 5)
- (iii) mother's level of education (appendix 6)

none of these factors significantly affected mother's knowledge regarding feeding during diarrhoea.

(13) Distribution of knowledge regarding foods that one should avoid during diarrhoea.

TABLE III

Foods to be avoided	frequency	Percentage
Milk &-milk products	32	14.9%
Uji &/or Ugali	12	5.6%
Beans	7	3.34%
Others-green-vegs,fruits	7	3.34%
Nil	157	73%
Total	215	100%

Table III above shows that 73% of mothers said they would not avoid any particular foods during diarrhoea. 14.9% of mothers said they would avoid milk and milk-products.

(14) Knowledge whether fluids should be given during diarrhoea.

TABLE IV
KNOWLEDGE ON FLUID ADMINISTRATION DURING DIARRHOEA.

Fluid administration	Frequency	%
YES	213	99%
NO	1	0.5%
DO NOT KNOW	1	0.5%
Total	215	100%

99% of mothers said they would administer fluids during diarrhoea in their children.

(15) Distribution of knowledge regarding types of fluids to be administered during diarrhoea

TABLE V

TYPE OF FLUIDS	FREQUENCY	PERCENTAGE
Plain water	16	7.5%
SSS	37	17.3%
SSS + Fruit juice	41	19.2%
SSS + Fruit juice + milk	21	9.8%
Plain water + SSS	8	3.7%
SSS + Uji	23	10.7%
SSS + other	8	3.7%
Other combinations of above	80	37.5%
Total	213	100%

If one considers administration of salt sugar solution (in combination with other fluids) then 74.1% of mothers knew about the use of SSS during diarrhoea. Only 3.2% of mothers said they would administer ORS during diarrhoea. On being asked specifically about knowledge of ORS, then 69.8% of mothers had heard about it, while 30.2% had never heard of ORS.

(I6) Knowledge of oral rehydration solution

TABLE VI

Knowledge of ORS	Frequency	percentage
YES	150	69.8%
NO	65	30.2%
TOTAL	215	100.%

From Table VI above, it can be seen that 69.8% of mothers had heard of ORS.

When knowledge of ORS was tested by :-

- (i) mother's age (appendix 19)
- (ii) mother's parity (appendix 20)
- (iii) mother's level of education (appendix 21)

Only mother's parity was significantly different.

Mothers with more than two children having increased knowledge about ORS.

(I7) Source of knowledge about ORS

TABLE VII

Source	Frequency	Percentage
Health facility	134	62.3%
Shops/Market	8	3.7%
Radio/TV/Newspaper	3	1.4%
Other mothers	5	2.3%
Not applicable	65	30.2%
Total	215	100%

From Table VII above, it can be seen that 62.3% of mothers heard of ORS from health facilities. Only 1.4% of mothers heard of ORS from mass media.

(18) Knowledge regarding food and fluid administration to a child who vomits immediately he/she is fed.

TABLE VIII

Action	Frequency	percentage
STOP ALL FLUIDS & FOODS	6	2.8%
continue fluids, stop foods	46	21.4%
Continue fluids & foods	163	75.8%
TOTAL	215	100%

From Table VIII above, it can be seen that 75.8% of mothers would continue administering fluids and foods to a child who vomits. Only 2.8% of mothers would stop all fluids and foods.

Of the mothers who said they would continue feeding their children, 91.4% said they would feed the same quantity of fluids/food at the same rate as previously, while 8.6% of mothers said they would feed smaller quantities of fluids/foods over longer period of time.

(19) Knowledge of methods of prevention of diarrhoea.

TABLE IX

Method of preventing diarrhoea	Frequency	Percentage
Keep utensils clean and food well covered	30	13.9%
Keep utensils clean and prevent child handling dirty objects	16	7.4%
Keep utensils clean, food well covered plus other	12	5.6%
Utensils clean/ food well covered/ washing hands	24	11.2%
Various combinations of above	54	25.2%
Do not know	79	36.7%
TOTAL	215	100%

Table IX shows that 36.7% of mothers did not know how to prevent diarrhoea. Commonest method of preventing diarrhoea was keeping utensils clean and food well covered. If one considers knowledge of utensils and food hygiene in combination with other methods, then 47.9% (113) of the mothers knew about them. If one considers knowledge of hand washing in combination with other methods, then 17.2% (37) of mothers know about handwashing as a method of preventing diarrhoea.

When Knowledge of methods of prevention of diarrhoea was tested by:-

- (i) mother's age (appendix 25)
- (ii) mother's parity (appendix 26)
- (iii) mother's level of education (appendix 27)

Only level of education was significantly different. Increasing level of education was associated with knowledge of appropriate methods of diarrhoea prevention.

(20) Mother's knowledge on whether diarrhoea
can cause death

TABLE X

YES	196 mothers	91.2%
NO	9 mothers	4.2%
DO NOT KNOW	10 mothers	4.7%
TOTAL	215	100%

From Table X above it can be seen that 91.2% of mothers know that diarrhoea can cause death.

When this knowledge was tested by :-

- (i) mother's age (appendix 7)
- (ii) mother's parity (appendix 8)
- (iii) mother's level of education 9)

None of these factors significantly influenced mother's knowledge regarding death during diarrhoea.

(2I) Knowledge regarding causes of death in a child who has diarrhoea

TABLE XI

CAUSE OF DEATH	FREQUENCY	PERCENTAGE
DEHYDRATION	117	54.4%
LOSS OF STRENGTH	32	14.9%
DUE TO NOT FEEDING	9	4.2%
DEHYDRATION + LOSS OF STRENGTH	11	5.1%
LOSS OF STRENGTH + NOT FEEDING	1	0.5%
DO NOT KNOW	26	12.1%
TOTAL	196	100%

From Table XI above, it can be seen that only 59.5% of mothers who knew that diarrhoea can cause death, said that death during diarrhoea is due to dehydration.

When knowledge regarding cause of death during diarrhoea was tested by :-

- (i) mother's age (appendix IO)
- (ii) mother's parity (appendix II)
- (iii) mother's level of education (appendix I2)

Increasing level of education was associated with knowledge regarding cause of death.

(22) Knowledge of how to prevent dehydration

TABLE XII

METHOD OF PREVENTING DEHYDRATION	FREQUENCY	PERCENTAGE
ORAL FLUIDS	198	92.1%
ORAL FLUIDS + FEEDING	6	2.7%
ANTI-DIARRHOEAL MIXTURE	1	0.5%
FEEDING	1	0.5%
NOT APPLICABLE	9	4.2%
TOTAL	215	100%

Table XII shows that 92.1% of mothers said they would prevent dehydration by administering oral fluids.

When this was tested by:-

- (i) mother's age (appendix 28)
- (ii) mother's parity (appendix 29)
- (iii) mother's level of education (appendix 30)

No significant difference was noted by any of above factors.

(23) Knowledge of signs of dehydration

TABLE XIII

SIGNS	FREQUENCY	PERCENTAGE
Dry mouth	10	4.7%
reduced skin turgor	10	4.7%
Child looks pale	13	6.0%
Eyes look white	8	3.7%
sunken eyes, loss of strength	18	8.4%
Other combinations of above	76	35.0%
Do not know	62	28.8%
TOTAL	215	100%

From Table XIII above, it can be seen that 42.7% of mothers knew at least two signs of dehydration. 28.8% of the mothers did not know any signs of dehydration. In addition, 9.7 % mothers assessed dehydration by child looking pale or eyes looking white.

When knowledge of signs of dehydration was tested by:-

- (i) mother's age (appendix I3)
- (ii) mother's parity (appendix I4)
- (iii) mother's level of education (appendix I5)

Only mother's level of education was significantly associated with knowledge of signs of dehydration. Increasing level of education was associated with knowledge of signs of dehydration.

(24) Knowledge of useful drugs to administer during diarrhoeal illness.

TABLE XIV

DRUGS	FREQUENCY	PERCENTAGE
ANTI-DIARRHOEAL MIXTURE	23	11.1%
HERBS	11	5.1%
CHARCOAL	13	6%
ASPIRIN/CAFENOL	3	1.4%
DO NOT KNOW	6	2.8%
NIL EXCEPT THOSE FROM HEALTH FACILITY	156	72%
TOTAL	215	100%

From Table XIV above, it can be seen that 2.8% of mothers said they did not know any useful drugs and 72% said they would not administer any drugs at home unless prescribed by health staff.

When knowledge of useful drugs to administer during diarrhoeal illness was tested by:-

- (i) mother's age (appendix I6)
- (ii) mother's parity (appendix I7)
- (iii) mother's level of education (appendix I8)

None of these factors significantly affected knowledge of useful drugs.

(D) SOURCE OF KNOWLEDGE REGARDING DIARRHOEA

TABLE XV

SOURCE OF KNOWLEDGE	FREQUENCY	PERCENTAGE
HEALTH FACILITY	176	81.9%
RADIO/TV/NEWSPAPER	4	1.9%
OTHER MOTHERS.	2	0.9%
SCHOOL	13	6.0%
OTHER (Eg. just know)	4	1.9%
HEALTH FACILITY & SCHOOL	16	7.4%
	215	100%

Health facility and school are major sources of knowledge about diarrhoea. (81.9% and 6% respectively). Mass media do not seem to be significantly involved or do not make significant impact (accounting for only 1.9%).

(E) ATTITUDES REGARDING DIARRHOEA

(25) Belief on whether diarrhoea is preventable

TABLE XVI

BELIEF	FREQUENCY	PERCENTAGE
YES	136	63.3%
NO	37	17.2%
DO NOT KNOW	42	19.5%
TOTAL	215	100%

Table XVI shows that 63.3% of mothers believe that diarrhoea can be prevented, while 17.2% of mothers believe that diarrhoea is not preventable.

When this was tested by:-

- (i) mother's age (appendix 22)
- (ii) mother's parity (appendix 23)
- (iii) mother's level of education (appendix 24)

Only level of education was significantly different, increasing level of education was associated with belief that diarrhoea can be prevented.

(26) Mother's belief on whether dehydration can be prevented.

TABLE XVII

BELIEVE DEHYDRATION PREVENTABLE	FREQUENCY	PERCENTAGE
YES	206	95.8%
NO	1	0.5%
DO NOT KNOW	8	3.7%
TOTAL	215	100%

Table XVII shows that 95.8% of mothers believe that dehydration can be prevented.

(27) Belief on whether oral fluids alone are sufficient to manage diarrhoea.

TABLE XVIII

BELIEF	FREQUENCY	PERCENTAGE
YES	84	39%
No	101	47%
DO NOT KNOW	30	14%
TOTAL	215	100%

Table XVIII shows that 39% of mothers believe that diarrhoea can be managed by oral fluids alone.

When this was tested by :-

- (i) mother's age (appendix 31)
- (ii) mother's parity (appendix 32)
- (iii) mother's level of education (appendix 33)

Each of these factors was associated with belief that diarrhoea can be managed by oral fluids alone. Increasing maternal age, parity and level of education were all independently associated with belief that diarrhoea can be managed by oral fluids alone.

Of the mothers who said oral fluids alone were not sufficient, 95% said the children needed to be taken to health facility for treatment.

(F) PRACTICE OF MOTHERS DURING DIARRHOEA IN THEIR CHILDREN

(28) Action taken by mothers whose children had diarrhoea

TABLE XIX

ACTION TAKEN	FREQUENCY	PERCENTAGE
Continued feeding	46	21%
Continued feeding, sought advice, gave fluids	79	36.7%
Continued feeding, gave fluids, gave medicine	14	6.5%
Continued feeding, gave fluids	56	26.0%
Stopped feeding, gave fluids	1	0.5%
Continued feeding, sought advise	4	1.9%
Continued feeding, sought advise, gave fluids, gave medicine	15	7.0%
TOTAL	215	100%

From Table XIX above, it can be seen that all mothers except one continued feeding their children. Only 13.4% of mothers administered medicines at home.

(29) Medication administered to children with diarrhoea.

TABLE XX

MEDICATION	FREQUENCY	PERCENTAGE
ADM (Anti-diarrhoeal)	10	4.7%
Herbs	6	2.8%
Anti-malarials	2	0.9%
ASA/Cafenol/Aspro	5	3.4%
Others	9	4.2%
Nil medication	182	84.7%
TOTAL	215	100%

From Table XX above, it can be seen that 4.7% of mothers administered ADM.

3.4% of the mothers administered ASA/Cafenol.

2.8% of the mothers administered herbs.

(30) Foods which were administered during diarrhoea.

TABLE XXI

TYPE OF FOOD	FREQUENCY	PERCENTAGE
Breastfeeding only	84	39.1%
Breastfeeding & bananas	20	9.3%
Breastfeeding & bananas & other	12	5.6%
Breastfeeding & bananas & fruit	15	7%
Breastfeeding, fruits & cerelac	10	4.7%
Breastfeeding & other	6	2.8%
Other combinations of above	53	24.5%
No foods	15	7%
Total	215	100%

Table XXI shows that breastfeeding prevalence in various combinations was 82.7% (178 out of 215). Bananas are commonly administered during diarrhoea (33%)

When food administration during diarrhoea was tested by:-

- (i) mother's age (appendix 34)
- (ii) mother's parity (appendix 35)
- (iii) mother's level of education (appendix 36)

Only maternal parity was significantly different. Mothers with more than two children breastfed and administered bananas and fruits more commonly than mothers with less than two children.

(3I) Fluids which were administered during diarrhoea.

TABLE XXII

TYPE OF FLUIDS	FREQUENCY	PERCENTAGE
SSS	25	11.6%
SSS + Fruit Juice	8	3.7%
Uji + Plain Water	15	7%
SSS + Uji	38	17.7%
SSS + Milk + Uji	35	16.3%
SSS + Milk	18	8.4%
Milk	5	2.3%
Plain Water	7	3.3%
Uji + ORS	7	3.3%
Uji + Fruit Juice + Plain Water	6	2.8%
SSS + Uji + Fruit Juice	7	3.3%
Other Combinations	42	19.5%
Nil	2	1%
TOTAL	215	100%

From Table XXII above, only 2 children were not given any fluids. Commonest combination of fluids administered was SSS + Uji, followed by SSS + milk + Uji.

If one considers administration of SSS in combination with other fluids, then 68.8% of children were given SSS. If one considers administration of ORS in combination with other fluids then 11.1% of the children were given ORS.

Problem with SSS - Various combinations were administered at home none of which make right combination of salt, sugar and water, which should be 8 level teaspoonfuls sugar and 1 level teaspoonful of salt dissolved in 1 litre of water.

Of the children who were given SSS at home in this study :-

14 children received solution consisting of $\frac{1}{4}$ teaspoon salt, $\frac{1}{4}$ teaspoon sugar dissolved in 1 cupful of water.

19 children received solution consisting of $\frac{1}{2}$ teaspoon salt, $\frac{1}{2}$ teaspoon sugar dissolved in 1 cupful of water.

8 children received solution consisting of pinch of salt, 1 teaspoon sugar and 1 cupful water.

Various other combinations were administered with most of them having too little sugar and too much salt.

(32) Where advise was sought before coming to hospital.

TABLE XXIII

Place	Frequency	percentage
Other Health facility	113	52.6%
K.N.H. directly	98	45.6%
Other mothers	1	0.5%
Traditional medicineman	1	0.5%
TOTAL	213	100%

From Table XXIII above, 52.6% of the children were seen at other health facilities before being referred to or presenting themselves at KNH. The traditional medicineman was consulted by only one mother.

(G) KNOWLEDGE REGARDING DIARRHOEA COMPARED TO PRACTICE.

(33) Knowledge regarding fluids administration during diarrhoea compared to practice.

TABLE XXIV

FLUID COMBINATIONS	KNOWLEDGE	PRACTISE
SSS	158 (74.1%)	148 (68.8%)
ORS	150 (69.8%)	24 (11.1%)
SSS & Fruit Juice	41 (19.2%)	8 (3.7%)
SSS & Uji	23 (10.7%)	38 (17.5%)
Plain water	24 (11.2%)	21 (9.8%)

99% of the mothers said that fluids should be administered during diarrhoea, in practice 99.5% of the mothers administered fluids.

There was similarity in knowledge of different fluids and utilisation, except for ORS and fruit juices. This underutilisation of ORS and fruit juices is probably due to lack of ready availability.

(34) Knowledge regarding feeding during diarrhoea compared to practice.

TABLE XXV

FEEDING PRACTICE	KNOWLEDGE	PRACTICE
BF only	6%	39.1%
BF + OTHER FOODS	93%	53.9%
Nil	0.9%	7%

From Table XXV it appears that breastfeeding was continued but other foods were less commonly administered in practice.

(35) Knowledge of useful drugs to administer during diarrhoea compared to practice.

TABLE XXVI

DRUGS	KNOWLEDGE	PRACTISE
Anti-diarrhoea mixture	11.1%	4.7%
Herbs	5.1%	2.8%
Charcoal	6.0%	4.2%
ASA/Cafenol	1.4%	3.4%
Nil medication	72.0%	84.7%
TOTAL	100%	100%

In general, less utilisation of drugs at home was practiced during diarrhoea, which is a commendable practice.

DISCUSSION

From the results above, it is noted that the majority of mothers who bring their children to Kenyatta National Hospital for management of diarrhoea are in the age group 20 - 29 years making up 74.9% of all mothers (Figure 1). Of all mothers, 73.1% had three children or less (Figure 3). These proportions are in keeping with findings of the Kenya Fertility Survey which showed that by age 25 - 29 years, mothers in Kenya will have given birth to 3.76 children (17).

Regarding level of education, 15.8% of mothers had no formal education, 59.1% had received primary education and 25.1% had received secondary education and above (Figure 2). Other studies have shown similar levels of mother's education in Kenya (17, 18).

Mothers who came to Kenyatta National Hospital with their children are usually from low income groups in Nairobi. This is reflected in the findings of this study showing that 48.8% of mothers who brought their children for treatment of diarrhoea came from Kibera, Mathare and Kariobangi which are areas in Nairobi where the majority of low income groups in Nairobi reside in (Figure 4). These mothers spend between 2 - 4 shillings on bus fare to reach KNH for treatment and spend similar amount of money to go back home after receiving treatment (Figure 5). This money could probably be better utilised for buying oral rehydration

salts or other essential items like food if these children were managed at home by the mothers.

The findings of this study show that the 93.6% of children seen at KNH Paediatric Filter Clinic for management of diarrhoea fall between age groups 5 - 19 months (Figure 6). These findings are similar to findings of other studies done in Kenya (5, 19).

Regarding degree of dehydration, 36.3% of children had no signs of dehydration, 57.7% had signs of some dehydration while 6% had signs of severe dehydration (Figure 8). 66.5% of these children presented within 4 days of onset of diarrhoea (Figure 7). The low incidence of severe dehydration in this study probably reflects early institution of oral fluids at home and at other health facilities before children are referred to KNH.

Majority of the children in this study (77.7%) were being breastfed in addition to other milk and food supplementation (Figure 9). This finding is in keeping with breastfeeding and weaning practices in Kenya (20, 21, 22). Breastfeeding and administration of other foods was continued during diarrhoea in 93% of patients (Figure 9). This is commendable practice. It is interesting to note that bananas (fresh or cooked) are commonly administered during diarrhoea in children. Of the mothers who gave other foods in addition to

breastfeeding, 33% gave bananas (Table XXI). Children in Kenya are commonly given bananas as supplement during weaning. In other studies regarding weaning practices in Kenya, 40.6% of children between 5 months and 1 year were given bananas in addition to other foods (21).

In this study only 53.3% of mothers are aware of some causes of diarrhoea (Table I). Of all mothers 63.3% believe that diarrhoea can be prevented and of these 83% said they would prevent diarrhoea by improved food hygiene, utensil hygiene, hand washing and preventing their child from handling dirty objects (Table IX). Increasing level of education was associated with knowledge of causes of diarrhoea and knowledge of method of diarrhoea prevention. Health education efforts need to be directed towards educating mothers regarding specific hygiene related behaviour to reduce incidence of diarrhoeal disease. Studies done in Bangladesh, U.S.A. and Guatemala relating to the impact of health education programmes on diarrhoea have shown reduction in diarrhoea incidence rates of between 14% and 48% (14). Available evidence suggests that intervention programmes relating to health education may be cost effective in reducing diarrhoea morbidity (14).

Virtually all mothers interviewed said they would continue breastfeeding and other foods during diarrhoea. In practice, 93% of mothers continued feeding their children during diarrhoea (Table XXI). This is commendable and it probably reflects upon health education given at health facilities regarding continuation of

feeding during diarrhoea.

Most of the mothers (99%) said they would administer fluids to their children during diarrhoea. These fluids consisted of salt-sugar solution (74.1%), fruit juices (29%), uji (10%) and plain water (11.2%) (Table V). Of all mothers, 99% administered some type of fluid at home during diarrhoea, but majority of mothers (68.8%) gave home made salt sugar solution which was inappropriately prepared (Table XXII). From this study, it is apparent that mothers know that fluids should be administered but need to be educated and oriented towards utilisation of home fluids like fruit juices, uji, coconut water, rice water and other cereal based fluids rather than a preparation of salt-sugar solution which has been noted to be associated with hypernatraemia if too much salt is added (1).

It is interesting to note that 91.2% of mothers know that diarrhoea can cause death (Table X). This is in contrast to community studies done in Siaya and Kisii which are rural areas in Kenya where only 40% and 60% of mothers respectively are aware that a child who has diarrhoea may die (23). Only 59.5% of the mothers in this study are aware that death during diarrhoea is usually due to dehydration (Table XI). This difference in knowledge between this study and community studies in rural areas is probably due to mothers in this study being a select population who have been referred to KNH from another facility and are also nearer health facilities than rural mothers.

In this study, increasing level of education of mothers was associated with knowledge of cause of death during diarrhoea.

Regarding dehydration, 95.8% of mothers believe dehydration during diarrhoea is preventable (Table XVII). Of these 99% of mothers know that administration of oral fluids and feeding during diarrhoea can prevent dehydration. About 69.8% of mothers know about oral rehydration solution during diarrhoea (Table VI) but in practice only 11.1% of children were given ORS during diarrhoea (Table XXII). This probably reflects upon availability and accessibility of ORS to these mothers. ORS sachets in Kenya are expensive and are not within the financial reach of most of the study mothers (24). More widespread availability of ORS sachets will probably lead to increased utilisation in future.

Only 42.7% of mothers know at least two signs of dehydration (Table XIII). In general most mothers did not know any signs of dehydration. Mothers are being encouraged to manage children with diarrhoea with fluids at home without reliance on formal health facilities but they need to be educated to recognise danger signs of dehydration so that they may bring their children to hospital in time. In this study increasing maternal level of education was associated with knowledge of signs of dehydration.

Regarding administration of drugs at home during diarrhoea, 72% of mothers said they would not administer any medication unless prescribed by medical personnel (Table XIV). Only 15.3% of mothers administered drugs bought in shops or herbs during diarrhoea; of these, the majority administered anti-diarrhoeal mixtures (Table XX). Of all mothers 39.1% of mothers believe that diarrhoea may be treated with oral fluids alone and a further 45% said they would administer oral fluids at home and then take the child to hospital (Table XVIII). From this study it seems health education has been effective in encouraging use of oral fluids rather than drugs during diarrhoea.

Mother's knowledge regarding diarrhoea was mainly obtained from health facilities (81.9%) and schools. (7.4%). Only 1.9% of mothers obtained their knowledge from mass media. (Table XV). Utilisation of mass media especially radio programmes needs to be implemented in health education of mothers. Many rural homes have access to radios while comparatively, few homes have access to televisions and newspapers. Schools should also be utilised to educate future mothers and fathers regarding diarrhoea. This is an important and yet under-utilised avenue for health education.

RECOMMENDATIONS

- (1) Community-based studies on similar aspects of knowledge, attitude and practices are needed to assess areas of deficient knowledge in the community.

- (2) Formal education of mothers-to-be will probably lead to decreased incidence of diarrhoea and also increased self-reliance rather than reliance on health facilities for management of acute diarrhoea in their children.

- (3) There is urgent need to educate mothers about different types of home fluids (avoiding salt-sugar solutions) and knowledge of signs of dehydration so that mothers may identify danger signs in their children.

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Knowledge regarding causes of diarrhoea by mothers age in years.

MOTHERS AGE IN YEARS

CAUSES	15-24 YRS	GREATER THAN 24 YEARS	TOTAL
Dirt, food-hygeine	3 (2.3%)	2 (2.4%)	5 (2.3%)
Dirt	6 (4.5%)	2 (2.4%)	8 (3.7%)
Dirt, food-hygeine, utensil-hygeine	29 (22%)	19 (22.9%)	48 (22.3%)
Dirt, utensil-hygeine, other.	1 (0.8%)	1 (1.2%)	2 (0.9%)
Dirt, food-hygeine other	6 (4.5%)	4 (4.8%)	10 (4.7%)
Disease, food-hygeine	4 (3.0%)	3 (3.6%)	7 (3.3%)
Do not know	64 (48.5%)	37 (44.6%)	101 (47.0%)
other combinat-ion	19 (14.4%)	15 (18.1%)	34 (15.8%)
TOTAL	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

1.42

DF

7

Significance $p=0.98$

No significant difference between younger and older mothers.

Knowledge regarding causes of diarrhoea by mother's parity.

NUMBER OF CHILDREN			
CAUSES	LESS THAN OR EQUAL TO TWO	GREATER THAN 2	TOTAL
Dirt, Food - hygiene	2 (1.0%)	3 (3.0%)	5 (2.3%)
Dirt	6 (5.2%)	2 (2.0%)	8 (3.0%)
Dirt, Food-hygiene Utensil-hygiene	28 (24.1%)	20 (20.2%)	48 (22.3%)
Dirt, Utensil-hygiene Other	0 (0%)	2 (2.0%)	2 (0.9%)
Dirt, Other Food-hygiene	5 (4.3%)	5 (5.1%)	10 (4.7%)
Disease, Food-hygiene	6 (5.2%)	1 (1.0%)	7 (3.3%)
Do not know	52 (44.8%)	49 (49.5%)	101 (47.0%)
Other combination	17 (14.7%)	17 (17.2%)	34 (15.8%)
TOTAL	116 (54%)	99 (46.0%)	215 (100%)

<u>Chi-square</u>	<u>DF</u>	<u>Significance</u>
7.89	7	P=0.34

No significant different between mothers with less than two children compared to mothers with more than two children.

Knowledge regarding causes of diarrhoea by mother's level of education.

LEVEL OF EDUCATION

CAUSES	NIL	PRIMARY	SECONDARY AND ABOVE	TOTAL
Dirt, Food-hygeine	0	5 (3.9%)	0	5 (2.3%)
Dirt	0	6 (4.7%)	2 (3.7%)	8 (3.7%)
Dirt, Food-hygeine Utensil-hygeine	6 (17.6%)	25 (19.7%)	17 (31.5%)	48 (22.3%)
Dirt, Utensil-hygeine, Other.	0	1 (0.8%)	1 (1.9%)	2 (0.9%)
Dirt, Food-hygeine Other	1 (2.9%)	4 (3.1%)	5 (9.3%)	10 (4.7%)
Disease, Food-hygeine	0	6 (4.7%)	1 (1.9%)	7 (3.3%)
Do not Know	26 (76.5%)	59 (46.5%)	16 (29.6%)	101 (47.0%)
Other combina-tion	1 (2.9%)	21 (16.5%)	12 (22.2%)	34 (15.8%)
TOTAL	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-squareDFSignificance

29.0

14

P= 0.01

Significant difference. Increasing level of education positively correlated with increasing knowledge of causes of diarrhoea. No significant difference between mothers with primary education and secondary education (P= 0.107)

APPENDIX 4

Knowledge whether child should be fed during diarrhoea by mother's age.

Child feeding	15-24 Yrs	Greater than 24 years	Total
Stop BF and other foods	0	2 (2.4%)	2 (0.9%)
Continue BF, stop other foods	9 (6.8%)	4 (4.8%)	13 (6.0%)
Continue BF and other foods	123 (93.2%)	77 (92.8%)	200 (93%)
TOTAL	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

DF

Significance

3.5

2

p=0.17

No significant difference by mother's age.

APPENDIX 5

Knowledge whether child should be fed during diarrhoea by mother's parity.

NUMBER OF CHILDREN

Child feeding	Less than or equal to two	Greater than two	Total
Stop BF and other foods	0 (0%)	2 (2.0%)	2 (0.9%)
Continue BF, stop other foods	7 (6.0%)	6 (6.1%)	13 (6.0%)
Continue BF and other foods	109 (94%)	91 (91.9%)	200 (93%)
TOTAL	116 (54%)	99 (46%)	215 (100%)

Chi-square

DF

Significance

2.36

2

P =0.3

No significant difference by mother's parity.

APPENDIX 6

Knowledge whether child should be fed during diarrhoea by mother's level of education.

LEVEL OF EDUCATION

Child feeding	Nil	Primary	Secondary and above	Total
Stop BF and other foods	0	0	2 (3.7%)	2 (0.9%)
Continue BF, stop other foods	1 (2.9%)	10 (7.9%)	2 (3.7%)	13 (6.0%)
Continue BF and other foods	33 (97.1%)	117 (92.1%)	50 (92.6%)	200 (93%)
TOTAL	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

7.7

DF

4

Significance

P= 0.1

No significant difference by level of education.

APPENDIX 7

Knowledge whether child with diarrhoea can die by mother's age.

MOTHER'S AGE IN YEARS

Child can die	15-24 Yrs	Greater than 24 years	Total
No	6 (66.7%)	3 (33.3%)	9 (4.2%)
Yes	118 (60.2%)	78 (39.8%)	196 (91.2%)
Do not know	8 (80%)	2 (20%)	10 (4.7%)
TOTAL	132 (61.4%)	23 (38.6%)	215 (100%)

Chi-square

1.68

DF

2

Significance

P=0.43

No significant difference by mother's age.

APPENDIX 9

Knowledge whether child with diarrhoea can die by mother's level of education

MOTHER'S LEVEL OF EDUCATION

Child can die	Nil	Primary	Secondary and above	Total
No	1 (11.1%)	7 (7.8%)	1 (11.1%)	9 (4.2%)
Yes	29 (14.8%)	117 (59.7%)	50 (25.5%)	196 (91.2%)
Do not know	4 (40%)	3 (30%)	3 (30%)	10 (4.7%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

6.7

DF

4

Significance

P=0.15

No significant difference by level of education.

APPENDIX IO

Knowledge of causes of death in children with diarrhoea
by mother's age

MOTHER'S AGE

Cause of death	15-24 Yrs	Greater than 24 years	Total
Dehydration	64 (54.7%)	53 (45.3%)	117 (54.4%)
Loss of strength	33 (76.7%)	10 (23.3%)	43 (20%)
Not feeding	4 (40%)	6 (60%)	10 (4.7%)
Other	3 (60%)	2 (40%)	5 (2.3%)
Not applicable	11 (78.6%)	3 (21.4%)	14 (6.5%)
Do not know	17 (65.4%)	9 (34.6%)	26 (12.1%)
TOTAL	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

10.3

DF

5

Significance

P=0.066

No significant difference by mother's age

APPENDIX II

Knowledge of causes of death in children with diarrhoea by mother's parity.

NUMBER OF CHILDREN

Cause of death	≤ 2	> 2	Total
Dehydration	59 (50.4%)	58 (49.6%)	117 (54.4%)
Loss of strength	23 (53.5%)	20 (46.5%)	43 (20%)
Not feeding	5 (50%)	5 (50%)	10 (4.7%)
Other	3 (60%)	2 (40%)	5 (2.3%)
Not applicable	10 (71.4%)	4 (28.6%)	14 (6.5%)
Do not know	16 (61.5%)	10 (38.5%)	26 (12.1%)
Total	116 (54%)	99 (46%)	215 (100%)

Chi-square

3.04

DF

5

Significance

p=0.69

No significant difference by mother's parity.

APPENDIX 12

Knowledge of causes of death in children with diarrhoea by mother's level of education.

LEVEL OF EDUCATION

Cause of death	NIL	Primary	Secondary and above	Total
Dehydration	14 (12%)	67 (57.3%)	36 (30.8%)	117 (54.4%)
Loss of Strength	7 (16.3%)	24 (55.8%)	12 (27.9%)	43 (20%)
Not feeding	4 (40%)	6 (60%)	0 (0%)	10 (4.7%)
Other	0 (0%)	3 (60%)	2 (40%)	5 (2.3%)
Not applicable	5 (35%)	7 (50%)	2 (14.3%)	14 (6.5%)
do not know	4 (15.4%)	20 (76.9%)	2 (7.7%)	26 (12.1%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

19.2

DF

10

Significance

P=0.037

Increasing level of education significantly associated with knowledge why children with diarrhoea die.

Knowledge of signs of dehydration by mother's age.

MOTHER'S AGE IN YEARS

Knowledge signs of dehydration	15-24 Yrs	Greater than 25 Yrs	Total
Skin turgor, Sunken eyes	30 (54.5%)	25 (45.5%)	55 (25.6%)
Loss of strength, eyes white, looks pale	15 (65.2%)	8 (34.8%)	23 (10.7%)
Dry mouth, sunken-eye, lack tears, urine vol	27 (69.2%)	12 (30.8%)	39 (18.1%)
sunken frontanelle, urine vol	10 (55.6%)	8 (44.4%)	18 (8.4%)
Loss of strength, Other	5 (33.3%)	10 (66.7%)	15 (7%)
Other combinations	2 (66.7%)	1 (33.3%)	3 (1.4%)
Do not know	43 (69.4%)	19 (30.6%)	62 (28.8%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

9.17

DF

6

Significance

P=0.16

No significant difference by mother's age.

Knowledge of signs of dehydration by mother's parity

NUMBER OF CHILDREN

Knowledge signs of dehydration	Less than or equal to two	Greater than 2	Total
Skin turgor, Sunken eyes	25 (45.5%)	30 (54.5%)	55 (25.6%)
Loss of strength, eyes white, looks pale	13 (56.5%)	10 (43.5%)	23 (10.7%)
Dry mouth, sunken-eye, lack tears, urine vol	23 (56.5%)	16 (43.5%)	39 (18.1%)
sunken frontanelle, urine vol	10 (55.6%)	8 (44.4%)	18 (8.4%)
Loss of strength, Other	8 (53.3%)	7 (46.7%)	15 (7.0%)
Other combinations	2 (66.7%)	1 (33.3%)	3 (1.4%)
Do not know	35 (56.5%)	27 (43.5%)	62 (28.8%)
Total	116 (54.0%)	99 (46%)	215 (100%)

Chi-square

2.4

DF

6

Significance

P=0.87

No significant difference by mother's parity

Knowledge of signs of dehydration by mother's level of education.

LEVEL OF EDUCATION

Knowledge signs of dehydration	Nil	Primary	Secondary and above	Total
Skin turgor, Sunken eye.	6 (10.9%)	37 (67.3%)	12 (21.8%)	55 (25.6%)
Loss of strength, eyes white, looks pale.	2 (8.7%)	14 (60.9%)	7 (30.4%)	23 (10.7%)
Dry mouth, sunken-eye, lack tears, urine vol.	5 (12.8%)	18 (46.2%)	16 (41.0%)	39 (18.1%)
sunken frontanelle, urine vol.	3 (16.7%)	9 (50%)	6 (33.3%)	18 (8.4%)
Loss of strength, Other	0	8 (53.3%)	7 (46.7%)	15 (7.0%)
Other combinations	0	3 (100%)	0	3 (1.4%)
Do not know	18 (29.0%)	38 (61.3%)	6 (9.7%)	62 (28.8%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square
28

DF
12

Significance
P= 0.004

Increasing level of education associated with knowledge of signs of dehydration.

Knowledge of useful drugs to administer during diarrhoea by mother's age

MOTHER'S AGE

Useful drugs	15-24 Yrs	Greater than 25 years	Total
ADM	15 (62.5%)	9 (37.5%)	24 (11.2%)
ASA/Cafenol	2 (66.7%)	1 (33.3%)	3 (1.4%)
Herbs	5 (45.5%)	6 (54.5%)	11 (5.1%)
Charcoal	9 (69.2%)	4 (30.8%)	13 (6.0%)
Nil	101 (61.6%)	63 (38.4%)	164 (76.3%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

1.56

DF

4

Significance

P= 0.81

No significant difference by mother's age

APPENDIX I7

Knowledge of useful drugs to administer during diarrhoea by mother's parity.

NUMBER OF CHILDREN

Useful drugs	Less than or equal to 2	Greater than 2	Total
ADM	13 (54.2%)	11 (45.8%)	24 (100%)
ASA/Cafeno.	2 (66.7%)	1 (33.3%)	3 (100%)
Herbs	3 (27.3%)	8 (72.7%)	11 (100%)
Charcoal	7 (53.8%)	6 (46.2%)	13 (100%)
Nil	91 (55.5%)	73 (44.5%)	164 (100%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

3.5

DF

4

Significance

P= 0.47

No significant difference by mother's parity

Knowledge of useful drugs to administer during diarrhoea by mother's level of education

LEVEL OF EDUCATION

Useful drugs	Nil	Primary	Secondary and above	Total
ADM	2 (8.3%)	13 (54.2%)	9 (37.5%)	24 (41.2%)
ASA/Cafenol	0	3 (100%)	0	3 (1.4%)
Herbs	2 (18.2%)	9 (81.8%)	0	11 (5.1%)
Charcoal	3 (23.1%)	7 (53.8%)	3 (23.1%)	13 (6.0%)
Nil	27 (16.5%)	95 (57.9%)	42 (25.6%)	164 (76.3%)
Total	34 (16.5%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

8.86

DF

8

Significance

P=0.35

No significant difference by level of education

APPENDIX 19

Knowledge of ORS by mothers age.

MOTHERS AGE IN YEARS

Knowledge	15-24Yrs	25Yrs & above	Total
NO	40 (61.5%)	25 (38.5%)	65 (30.2%)
YES	92 (61.3%)	58 (38.7%)	150 (69.8%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

DF

Significance

0.008

1

P= 1.0

No significant difference by mothers age.

Knowledge of ORS by mothers parity.

NUMBER OF CHILDREN

Knowledge	Less than or equal to 2	Greater than 2	Total
NO	43 (66.2%)	22 (33.8%)	65 (30.2%)
YES	73 (48.7%)	77 (51.3%)	150 (69.8%)
Total	116 (54%)	99 (46%)	215 (100%)

Chi-square

4.9

DF

1

Significance

P= 0.027

Increasing parity positively correlated with knowledge of ORS.

Knowledge of ORS by level of education.

Mothers LEVEL OF EDUCATION

Knowledge	Nil	Primary	Secondary &above	Total
NO	14 (21.5%)	39 (60%)	12 (18.5%)	65 (30.2%)
YES	20 (13.3%)	88 (58.7%)	42 (28%)	150 (69.8%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

DF

Significance

3.59

2

$P = 0.17$

No significant difference by level of education of mothers.

Whether mother believes that diarrhoea can be prevented by mothers age.

v

MOTHERS AGE IN YEARS

Prevent diarrhoea	15-24Yrs	Greater than 25Yr	Total
NO	24 (64.9%)	13 (35.1%)	37 (17.2%)
YES	80 (58.84)	56 (41.2%)	136 (63.3%)
Do not know	28 (66.7%)	14 (33.3%)	42 (19.5%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

1.05

DF

2

Significance

P= 0.59

No significant difference by mother's age.

Whether mother believes that diarrhoea can be prevented by mothers parity.

NUMBER OF CHILDREN

Prevent diarrhoea	Less than or equal to 2	Greater than 2	Total
NO	21 (56.8%)	16 (43.2%)	37 (17.2%)
YES	73 (53.7%)	63 (46.3%)	136 (63.3%)
Do not know	22 (52.4%)	20 (47.6%)	42 (19.6%)
Total	116 (54%)	99 (46%)	215 (100%)

Chi-square
0.16

DF
2

Significance
P= 0.9

NO significant difference by parity.

Whether mother believes that diarrhoea can be prevented by mothers level of education.

MOTHERS LEVEL OF EDUCATION

Prevent diarrhoea	NIL	PRIMARY	SECONDARY & ABOVE	Total
NO	9 (24.3%)	22 (59.5%)	6 (16.2%)	37 (17.2%)
YES	9 (6.6%)	83 (61.0%)	44 (32.4%)	136 (63.3%)
Do not know	16 (38.1%)	22 (52.4%)	4 (9.5%)	42 (19.5%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

30.6

DF

4

Significance

P= 0.001

Increasing level of education positively correlated with belief that diarrhoea can be prevented.

Knowledge of how to prevent diarrhoea by
mother's age

MOTHER'S AGE IN YEARS

Prevention methods	15 - 24 Years	Greater than 25 years	Total
Food and utensil hygiene	48 (60.8%)	31 (39.2%)	79 (36.7%)
Hand washing	4 (57.1%)	3 (42.9%)	7 (3.3%)
Prevent child from handling dirty objects	8 (72.7%)	3 (27.3%)	11 (5.1%)
Utensil hygiene Cover food	16 (53.3%)	14 (46.7%)	30 (14.0%)
Other combination of above	56 (66.3%)	32 (33.8%)	88 (41%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

6.09

DF

4

Significance

P= 0.41

No significant difference by mother's age

APPENDIX 26

Knowledge of how to prevent diarrhoea by
mother's parity

NUMBER OF CHILDREN

Prevention methods	Less than or equal to two	Greater than 2	Total
Food hygiene Utensil hygiene	40 (50.6%)	39 (49.4%)	79 (36.7%)
Hand washing	3 (42.9%)	4 (57.1%)	7 (3.3%)
Prevent child from handling dirty objects	10 (90.9%)	1 (9.1%)	11 (5.1%)
Utensil hygiene Cover food	16 (53.3%)	14 (46.7%)	30 (14%)
Other combination of above	47 (55%)	41 (45%)	88 (41%)
Total	116 (54.0%)	99 (46.0%)	215 (100%)

Chi-square

8.3

DF

4

Significance

P= 0.21

No significant difference by mother's parity

Knowledge of how to prevent diarrhoea by mother's level of education.

LEVEL OF EDUCATION

Prevention methods	Nil	Primary	Secondary and above	Total
Food hygiene Utensil hygiene	7 (8.9%)	45 (57.0%)	27 (34.2%)	79 (36.7%)
Hand washing	0	5 (71.4%)	2 (28.6%)	7 (3.3%)
Prevent child from handling dirty objects	I (9.1%)	6 (54.5%)	4 (36.4%)	II (5.1%)
Utensil hygiene Cover food	I (3.3%)	19 (63.3%)	10 (33.3%)	30 (14.0%)
Other combination of above	25 (30.3%)	52 (56.3%)	11 (12.5%)	88 (41%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

31

DF

8

Significance

P= 0.002

Increasing level of education associated with knowledge of how to prevent diarrhoea.

Knowledge of how to prevent dehydration by mothers age.

MOTHERS AGE IN YEARS.

Prevent dehydration	15-24Yrs	Greater than 25Yrs	Total
Oral fluids	121 (61.1%)	77 (38.9%)	198 (92.1%)
Oral fluids & feeding	5 (62.5%)	3 (37.5%)	8 (3.7%)
Not applicable	6 (66.7%)	3 (33.3%)	9 (4.2%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

0.11

DF

2

Significance

P=0.94

No significant difference by mothers age.

Knowledge of how to prevent dehydration by mothers parity

NUMBER OF CHILDREN

Prevent Dehydration	Less than or equal to two	Greater than 2	Total
Oral fluids	106 (53.5%)	92 (46.5%)	198 (92.1%)
Oral fluids & feeding	5 (62.5%)	3 (37.5%)	8 (3.7%)
Not applicable	5 (55.6%)	4 (44.4%)	9 (4.2%)
Total	116 (54%)	99 (46%)	215 (100%)

Chi-square

0.25

DF

2

Significance

P=0.87

No significant difference by mothers parity

Knowledge of how to prevent dehydration by
mothers level of education
LEVEL OF EDUCATION

Prevent dehydration	Nil	Primary	Secondary & above	Total
Oral fluids	32 (16.2%)	113 (57.1%)	53 (26.8%)	198 (92.1%)
Oral fluids & feeding	0 (0%)	8 (100%)	0 (0%)	8 (3.7%)
Not applicable	2 (22.2%)	6 (66.7%)	1 (11.1%)	9 (4.2%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

6.9

DF

4

Significance

P= 0.14

No significant difference by mothers level of education.

APPENDIX 3I

Belief whether diarrhoea can be managed by oral fluids alone by mother's age.

MOTHER'S AGE IN YEARS

BELIEF	15-24 Yrs	Greater than 25 Yrs	Total
No	66 (65.3%)	35 (34.7%)	101 (47%)
Yes	42 (50%)	42 (50%)	84 (39.1%)
Do not know	24 (80%)	6 (20%)	30 (14%)
TOTAL	132 (61.4%)	83 (38.6%)	215 (100%)

Chi-square

9.6

DF

2

Significance

p= 0.008

Increasing maternal age associated with increasing belief that diarrhoea can be managed by oral fluids alone.

APPENDIX 32

Belief whether diarrhoea can be managed by oral fluids alone by mother's parity.

NUMBER OF CHILDREN ..

BELIEF	Less than or equal to two	Greater than 2	Total
No	64 (63.4%)	37 (36.6%)	101 (47%)
Yes	34 (40.5%)	50 (59.5%)	84 (39.1%)
Do not know	18 (60%)	12 (40%)	30 (14%)
TOTAL	116 (54%)	99 (46%)	215 (100 %)

Chi-square

10.2

DF

2

Significance

P= 0.006

Significant difference; increasing parity associated with belief that diarrhoea can be managed by oral fluids alone.

Belief whether diarrhoea can be managed by oral fluids alone by mother's level of education.

LEVEL OF EDUCATION

Belief	Nil	Primary	Secondary and above	Total
No	19 (18.8%)	62 (61.4%)	20 (19.8%)	101 (47%)
Yes	7 (8.3%)	47 (56.0%)	30 (35.7%)	84 (39.1%)
Do not know	8 (26.7%)	18 (60%)	4 (13.3%)	30 (14%)
TOTAL	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-squareDFSignificance

12.6

4

P= 0.01

Significant difference, increasing level of education associated with belief that diarrhoea can be managed by oral fluids alone.

APPENDIX 34

Foods administered during diarrhoea by mother's age.

MOTHER'S AGE

Foods Administered	15-24 Years	Greater than 24 years	Total
Breast-feeding + Bananas	44 (62.9%)	26 (37.1%)	70 (30.6%)
Breastfeeding only	66 (60.6%)	43 (39.4%)	109 (50.7%)
Milk product + other	1 (50%)	1 (50%)	2 (0.9%)
Other combinations	21 (61.8%)	13 (38.2%)	34 (15.8%)
Total	132 (61.4%)	83 (38.6%)	215 (100%)

<u>Chi-square</u>	<u>DF</u>	<u>Significance</u>
0.21	3	P = 0.97

No significant difference by mother's age

APPENDIX 35

Foods administered during diarrhoea by mother's parity.

NUMBER OF CHILDREN

Foods administered.	Less than or = 2	Greater than two	Total
Breastfeeding + Bananas	46 (65.7%)	24 (34.3%)	70 (32.6%)
Breastfeeding only	50 (45.9%)	59 (54.1%)	109 (50.7%)
Milk product + other	0	2 (100%)	2 (0.9%)
Other Combinations	20 (58.8%)	14 (41.2%)	34 (15.8%)
Total	116 (54%)	99 (46%)	215 (100%)

Chi-square

DF

Significance

9.43

3

P = 0.02

Increasing parity was associated with breastfeeding and other food administered during diarrhoea.

APPENDIX 36

Foods administered during diarrhoea by mother's level of education.

LEVEL OF EDUCATION

Foods administered	Nil	Primary	Secondary and above	Total
Breastfeeding + bananas	10 (14.3%)	39 (55.7%)	21 (30%)	70 (32.6%)
Breastfeeding only	20 (18.3%)	64 (58.7%)	25 (22.9%)	109 (50.7%)
Milk product + other	0	2 (100%)	0	2 (0.9%)
Other combinations	4 (11.8%)	22 (64.7%)	8 (23.5%)	34 (15.8%)
Total	34 (15.8%)	127 (59.1%)	54 (25.1%)	215 (100%)

Chi-square

DF

Significance

3.51

6

P = 0.74

No significant difference by mother's level of education.

APPENDIX 37

CHART FOR DETERMINING DEGREE OF DEHYDRATION (MODIFIED FROM W.H.O. CONTROL OF DIARRHOEAL DISEASES PROGRAMME)

Diarrhoea Vomitting Thirst. Urine	Less than 4 stools/day Minimal Normal Normal volume	4 - 10 stools / day Some Increased Reduced volume	More than 10 stools /day Frequent Unable to drink No urine last 6 hours
Condition Tears Eyes Mouth Breathing	Well, alert Present Normal Wet Normal	Unwell, sleepy Absent Sunken Dry Faster	Drowsy, unconscious Absent Dry and sunken Very dry Very fast and deep
Skin Pulse Frontanelle	Normal Normal Normal	Reduced turgor Faster Sunken	Very reduced turgor Very fast and weak Very sunken
Dehydration status	Nil Dehydration	If child has 2 or more of these signs Mild-Moderate Dehydration	If child has 2 or more of these signs Severe dehydration

QUESTIONNAIRE ADMINISTERED TO MOTHER OR CHILD CARETAKER

MOTHER'S DATA

FOR OFFICE USE

1 Study case No.

2 Name _____

3 Age (Years)

4 Number of children

Total pregnancies

Live births

Living children

5 Level of education

1 Primary

2 Secondary

3 Above secondary

6 Place of residence

1 Kibera

7 Ongata Rongai

2 Jericho

8 Eastleigh

3 Kariobangi

9 Mathare

4 Kenyatta Estate

10 Riruta

5 Uthiru

11 Hurlingham

6 Kawangware

12 Dandora

13 Other specify _____

7 Aproximate busfare from home to hospital
(in Kenya shillings)

CHILD'S DATA

8 Date of birth ¹³¹⁴¹⁵¹⁶¹⁷¹⁸

9 Weight in grams ¹⁹²⁰²¹²²

10 Degree of dehydration

(1) Nil (2) Mild-Moderate (3) Severe

1 2

3 4

5 6

7 8

9

10

12 13

23

I1 Duration of diarrhoeal illness before presenting to hospital (in days) ²⁴

I2 How has child been fed during last one month

I Breastfeeding only

2 Breastfeeding with other milk only

3 Breastfeeding with other milk and foods

4 KCC/Formula milk only

5 KCC/Formula milk with other foods ²⁵

I3 Number of episodes of diarrhoeal illness since birth ²⁶

KNOWLEDGE

I4 Do you know the causes of diarrhoea in children?

I Yes

0 No ²⁷

I5 If yes, what is/are the causes?

I Dirt

2 Disease/infection/germs ²⁸

3 Lack of hygiene in food handling ²⁹

4 Lack of hygiene in utensil handling

5 Diarrhoea as symptom of other illness ³⁰

6 Other (specify)

7 N/A ³¹

I6 Regarding feeding, when a child gets diarrhoea, what should one do?

I Stop breastfeeding and other foods until diarrhoea stops

2 Continue breastfeeding but stop other foods.

- 3 Continue breastfeeding and other foods
- 4 Stop breastfeeding but continue other foods
- 5 Do not know

32

I7 If one should continue feeding the child, are there any foods that one should avoid?

- I Milk and milk products
- 2 Fruits
- 3 Green vegetables
- 4 Eggs
- 5 Meat
- 6 Uji
- 7 Ugali
- 8 Beans
- 9 Cassava
- IO Cerelac
- II Other (specify)
- I2 Oily foods
- I3 Not applicable

33

34

35

36

37

I8 Regarding fluids, when a child gets diarrhoea, what should one do?

- I Stop all fluids
- 2 Give fluids
- 3 Do not know

38

I9 If should give fluids, which type of fluids should one give the child?

- I Plain water
- 2 Mixture of water with salt
- 3 Mixture of water with sugar
- 4 Mixture of salt, sugar and water
- 5 Fruit juices

- I9 6 Milk 39
- 7 Tea
- 8 Uji 40
- 9 Oral rehydration solution
- I0 Soda 41
- II Soup
- I2 Do not know 42
- I3 Not applicable

- 20 Are there any fluids which one should not give to child who has diarrhoea
- I Yes
- 0 No
- 9 Do not know 44

- 21 If yes, which fluids should not be given?
- I Milk
- 2 Fruit juices 45
- 3 Water
- 4 Uji 46
- 5 Other (specify) _____
- 9 Not applicable 47

- 22 When a child who has diarrhoea is fed or given fluids and immediately vomits, what should one do?
- I Stop all fluids and foods
- 2 Continue fluids, but stop foods
- 3 Continue fluids and foods 48
- 9 Do not know

- 23 If should continue fluids and foods, then how should they be given?
- I Same quantity at same rate
- 2 Smaller quantities over longer period of time

23 3 Do not know 49

24 Can a child who has diarrhoea die?

I Yes

0 No

9 Do not know

50

25 If yes, why?

I Due to dehydration

2 Due to lose of strength

3 Due to not feeding

9 Do not know

4 Other (specify) _____

8 Not applicable

51

26 What signs of dehydration do you know?

I Dry mouth

2 Decreased skin turgor

3 Sunken frontanelle

4 Sunken eyes

5 Reduced urine volume

6 Lack of tears

7 Child looks pale

8 Rapid breathing

9 Increased thirst

10 Loss of strength

11 Eyes look pale

12 Other (specify) _____

13 Do not know

52

53

54

55

56

27 Which drugs/medicines are useful to administer when child has diarrhoea?

1 Anti-diarrhoeal mixture

2 Aspirin/Carenot/aspro

3 Antimalarials

4 Antibiotics

- 27 5 Herbs 57
- 6 Charcoal BPC 58
- 7 Nil 59
- 8 Other (specify) _____ 60
- 9 Do not know

- 28 Have you ever heard of oral rehydration solution?
 - I Yes 61
 - O No

- 29 If yes, where did you learn about it?
 - I Health facility 5 Shops/market
 - 2 Radio 6 Other mothers
 - 3 Television 7 Other (specify)
 - 4 Newspaper _____ 62
 - 9 Not applicable

- 30 Where did you get your knowledge about diarrhoeal disease from?
 - I Radio
 - 2 Television
 - 3 Newspaper
 - 4 Health facility
 - 5 Other mothers/grandmother
 - 6 School 63
 - 7 Other (specify) _____

ATTITUDE

- 3I Do you believe that diarrhoeal illness in children can be prevented?
 - I Yes
 - O No 64
 - 9 Do not know

32 If yes, how can it be prevented?

I By keeping utensils clean

2 By keeping food well covered and
clean

3 By washing hands before feeding child

4 By giving child boiled milk and water

5 Preventing child from handling/
swallowing dirty objects

6 Other (specify) _____

9 N/A

65

66

67

68

33 Do you believe that dehydration resulting
from diarrhoeal illness can be prevented?

I Yes

0 No

9 Do not know

69

34 If yes, how can it be prevented?

I By giving oral fluids

2 By giving anti-diarrhoeal mixtures

3 By feeding the child

4 Other (specify) _____

5 Do not know

9 Not applicable

70

35 Do you believe that diarrhoeal illness
can be managed by oral fluids only?

I Yes

0 No

9 Do not know

71

36 If no, what else needs to be done?

1 Take to health facility

2 Give medicines (specify)

3 Other (specify) _____

72

PRACTICE

37 When your child developed diarrhoea, what did you do?

1 Observed and stopped feeding

2 Observed and continued feeding

3 Sought advice

4 Gave fluids

5 Gave medicine

6 Other (specify)

73

74

75

76

77

78

38 If continued feeding, what foods did you give the child?

1 Breastfeeding 7 Beans

2 Milk products 8 Fruits

3 Ugali 9 Cerelac

4 Green vegetables 10 Bananas

5 Eggs 11 Beans-maize Mixture

6 Meat 12 Other (specify) _____

13 Not applicable

79

80

81

82

83

40 If you gave the child fluids, which fluids did you give?

1 Salt, sugar solution

2 Milk

3 Uji

4 Tea

5 Soup

6 Ribena

- 7 Soda
- 8 Fruit juices
- 9 ORS
- 10 Plain water
- 11 Other (specify) _____
- 12 Not applicable

41 If you gave salt-sugar solution,
 what quantities of salt, sugar
 and water did you mix?

Salt _____

Sugar _____

Water _____

- 89 Salt
- 90 Sugar
- 91 Water

42 If you sought advise before coming
 here, where did you seek it?

- 1 Health facility
- 2 Other mothers
- 3 Traditional medicineman
- 4 Other (specify) _____
- 5 N/A

92

43 If you gave medicine/drugs, which
 ones?

- 1 Antidiarrhoeal mixture
- 2 Herbs
- 3 ASA/Cafenol/Aspro
- 4 Anti-malarials
- 5 Other (specify) _____
- 6 Not applicable

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Dr. J. K. Alwar
Dr. J. K. Alwar
Dr. J. K. Alwar