North Galkayo mothers' experiences and perceptions of health education on diarrheal diseases prevention-

A hint about how less is more in improving the post conflict Somalia health system

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ABSTRACT

Background: Water, foods and hands are natural habitat or reservoir of infectious agents that cause diarrheal illnesses. A suggestion is that some simple techniques can easily interrupt the natural transmission chain of diarrheal illnesses among these are: treating water, improving food hygiene and robust hand washing practice in critical times during the day. Short interventions of training on hand washing, given to mothers while they are attending long queues at outpatient pediatric clinics, could be a feasible model to prevent diarrheal diseases and its complications. Such interventions create an ideal opportunity to train them; what causes diarrheal illnesses, signs and symptoms of degrees of dehydration, how to manage dehydration, when to go to hospital, and what happens if not promptly treated.

Aim: The aim was to understand how mothers to under-five children view diarrheal disease and their role in prevention and care as well as their experiences of being part in a short health education intervention to identify their concerns and the need for health education interventions.

Methods: This was a qualitative study where in-depth interviews were held with 15 mothers and as prerequisites being a mother: (i) to under-five children who have visited pediatric OPD facilities in Galkayo North. (ii) And seeking treatment for her child suffering from diarrheal disease. I had the assumption that, they could become potential key informants. Eight mothers out of the 15 had short-term health education training about the causes of diarrhea, signs and symptoms of dehydration and its classification degrees of severity; as well as about possible management and prevention of diarrhea. The remaining seven mothers did not get health education, and they have only undergone some interviews. The training happened after 7 days from the time when the mother was first met at outpatient pediatric clinic. This was aimed to give children time to recover and mothers to reflect about what the training would be like (for those who had the intervention); or spontaneously conceptualize what the interview may inquiry her.

Results: Both groups of mothers expressed their general longing for health education. They enthusiastically expressed how health education sessions could improve children's health and mentioned that they would train children, relatives and other neighbor mothers. They said that giving health education training to a mother means training the rest of the community. The mothers who had experienced a short health education acknowledged that health education helped them to move from despair to improving self-confidence after seeing the effects of their actions. That is to say, diarrhea has been absent from their houses or almost absent for one and half a year. Overall, the mothers realized that a short intervention training given to mothers could save lives of the children if this knowledge session is adopted by the hospitals and clinics in the country as whole.

Conclusion: The study showed that a minimalist and short-term intervention could serve as preventive measure of diarrheal illnesses. The mothers recognized and recommended creating a significant health education component in all levels of health care settings. This recommendation is pragmatic, practical and simply attainable but still a drastically missing link in the North Galkayo clinics both in private and public services.

INTRODUCTION

In 2016, approximately 5.6 million children worldwide died before their fifth birthday. Among these deaths, diarrhea is one of the major causes and claims 525,000 deaths every year (1). Diarrhea is recognized as one of the leading killer of children by UNICEF with a death toll up to 477,293in 2016 (2). This accounts for just about 8 per cent of all deaths among children under age 5 worldwide. In Somalia, *UNICEF* reports that the under five deaths due to diarrhea in 2016 numbers up to 10,224 of deceased children (3). Diarrhea is when the patient passes loose and watery stool more than 3 times a day. It is classified among group of diseases that are spread through a mode of transmission called Feco-oral transmission i.e. the causative organisms are excreted in the stools from an infected person or animal and then reaches in the mouth of other person (portal of entry) and thus uncertainly is ingested. Water, food and hands are natural habitat or 'Reservoir' of infectious agents that causes diarrheal illnesses. The natural transmission chain can simply be interrupted by treating water and improving food hygiene and practicing hand washing with soap as follows: before eating, before preparing food, before feeding the child, after defecation and after contact with child's feces (4).

In acute watery diarrhea, causative agents include diarrhea caused by number of viruses, bacteria and protozoa. The most common and notable virus is the Rotavirus. This type of virus belongs to the genus of Reoviridae. It has 7 subgroups which three of them infect the humans (A, B and C). Other viruses may be important causes of diarrheal disease in human, including Norwalk virus, Norwalk-like viruses, Enteric Adenoviruses, Caliciviruses, and Astroviruses (5).

Bacterial agents that cause diarrhea include: Vibrio Cholerae, Enterotoxicgenic Escherichia Coli, Non-typhi Salmonella, Yesinia Enterocolitica. The parasitic forms that cause diarrhea include Giardia Lamblia and Entamoeba Histolytica (the latter agent causes bloody diarrhea). However, other systemic infections for instance can manifest signs of diarrhea to the patients to name few are Malaria, Respiratory Infections and Acute Otitis. Some parasites like Giardia Lamblia also causes diarrhea to the children (6).

Dehydration is abnormal loss of total body water and body salts. In the human body, 75% is made of water. The United States Dehydration Council, developed physiological definitions of

dehydration, which is restrictive in clinical practice. It is described as two types of total body water loss, which are applicable in clinical settings: a) water-loss dehydration that is a reduction in total body water due primarily to a water deficit, and b) salt-loss dehydration resulting from both a salt and water deficit.

Capacity building for health care providers and community health workers on diarrhea treatment is a substantial measure in promoting health of the community. The effectiveness of an educational program to adhere to an expected behavior is achieved by using the synergy of educational and communication elements in health behavior theories that go beyond the cognitive to the affective and structure of volition (7).

Randomized trials have established that several child health interventions— *including breastfeeding, immunization, oral rehydration therapy,* and *micronutrient supplementation*—are both effective and cost-effective in treating and preventing diarrhea (8). This cost effective tetrad of preventing and treating diarrhea is easily available and affordable by the Somali community and health care facilities in Somalia except that rotavirus vaccine is currently not available. However, by augmenting this tetrad with other measures for example as in this study highlights *health education and awareness* for the mothers and care takers of children on hand washing with soap could intensify the prevention of diarrhea. Thus, the resulting pentad will be cost effective and momentous.

The aim of this study was to understand how mothers to under- five children view diarrheal diseases and their role in prevention and care as well as their experiences of being part in a short health education intervention to identify their concerns and needs for health education intervention. The target population is the mothers of under-five children in North Galkayo. However, Galkayo, which is a cosmopolitan town the researcher, anticipates that the town could be prototype for all other urban towns in Somalia and could represent Somali people's mainstream perception, as it accommodates several identifiable Somali people's subcultures. Therefore, what mothers think about health education in Galkayo is almost similar to other urban towns or districts in Somalia.

METHODS AND MATERIALS

The study location is North Galkayo Town. Galkayo is located 750 km northwards of Mogadishu and is the capital of Mudug Region. Two administrative divisions; North Galkayo and South Galkayo politically divide the town. These two divisions of the town are respectively governed by Puntland State of Somalia and Galmudug State of Somalia. Galkayo Town is located in the center of Mudug region. The estimated population of Galkayo is more than of 250 000 inhabitants (no appropriate census available). The North Galkayo's economy mainly depends on livestock and Somali diaspora community remittances to their families, the town imports variety of commodities from abroad. As in many places of Somalia, foreign aid is also another source of livelihood for Galkayo Town. International bodies notably WHO and UNICEF mainly fund the primary health care in North Galkayo, but co-implemented by the MoH Puntland and international non - governmental organizations. North Galkayo Town has infrastructures and health facilities in almost all its subordinate villages. Inside the town, the health sector is arranged in primary and secondary levels. In secondary health care, there are two main secondary care public hospitals and an increasing number of private hospitals.

The study was based on a qualitative research design, using in-depth interviews among mothers with children suffering from diarrheal illnesses. I regarded that in-depth interview was the most appropriate way to explore discrete experiences and opinions and as well, a convenient method to discover mothers' perceptions and feeling towards health education in the prevention of diarrheal illness (9).

The training took place after 7 days from the time when the mothers were first met at outpatient pediatric clinic. The aim was to give both children and mothers time to recover and to reflect about what the training would be like. After the training, a gap of 2 to 3 months was given them to before they were invited to the in-depth interviews, for them to have time to conceptualize and observe if the transmitted hand washing techniques with soap had changed their family life. The author of the paper is the facilitator of these trainings. These trainings were simplified communications and since some of the targeted trainee mothers might be semi-literate or illiterate pictures were mainly used for illustration, as well as practical demonstrated in front of the learners.

Besides that, the learners had opportunity to practice some of the actions exhibited like systematic hand washing with soap, as well as how to prepare ORS solution.

Since the aim of this study was to understand how mothers to under- five children view diarrheal diseases and their role in prevention and care, as well as their experiences of being part in a short health education intervention and at last but not least to identify their concerns and needs for health education intervention**.** Therefore, the plan was to give one group of mothers a short intervention training on diarrheal illness i.e. causes of diarrheal illnesses, signs and symptoms of dehydration, how to help children with dehydration, how to prevent and control diarrheal illnesses. The aim was then to wait for some months, to explore how they reflected and conceptualized and how they have used the information of the short training in their daily routine and their overall experience of the intervention.

The mothers who participated in this study were 15, and criteria of selection being a mother to under 5 children, who had presented diarrheal complaints as they came to pediatric outpatient clinic of Mudug Regional Hospital and to Arafat Pediatric Clinic for consultation and medical care. This was purposive sampling technique to obtain information rich cases, who were key informants about this particular phenomenon of interest (10). This study classified the mothers into two groups: (a) mothers who had short training on diarrhea and dehydration were 8 in number; (b) and another group of non-trained mothers who were 7 in quantity. After having conducted 15 interviews not much knew information was expected and the data felt saturated (11).

The author himself conducted interviews during a period of 7 months in different locations; eight interviews took place at the informants' house, while four interviews occurred at clinics and three were telephone interviews, depending on the informants' own preferences. The interview guide included four main themes and the questions under each theme were different depending on, if the interviewee had gone through a short intervention or not. Below is a summary of the themes discussed in the interviews. Appendix 1 exhibits the full interview guide.

- Knowledge of the mother on diarrhea accessibility to clean and safe water and food security
- Health seeking behavior and who else could provide support rather than health facilities

- Educational aptitude and enthusiasms of the participants and ability memorize communications conveyed.
- From despair to self-confidence after intervention

The data was analyzed based on qualitative content analysis which means following the steps of reading the text, choosing meaning units that are condensed and coded for later developing categories, sub-categories of the manifest meaning of the text, keeping close to what is actually said and later themes that focus more on the underlying latent meaning (13). Figure 1 gives an example of how the analysis moved from question in focus, via meaning unit, condensed meaning unit, codes and sub-category.

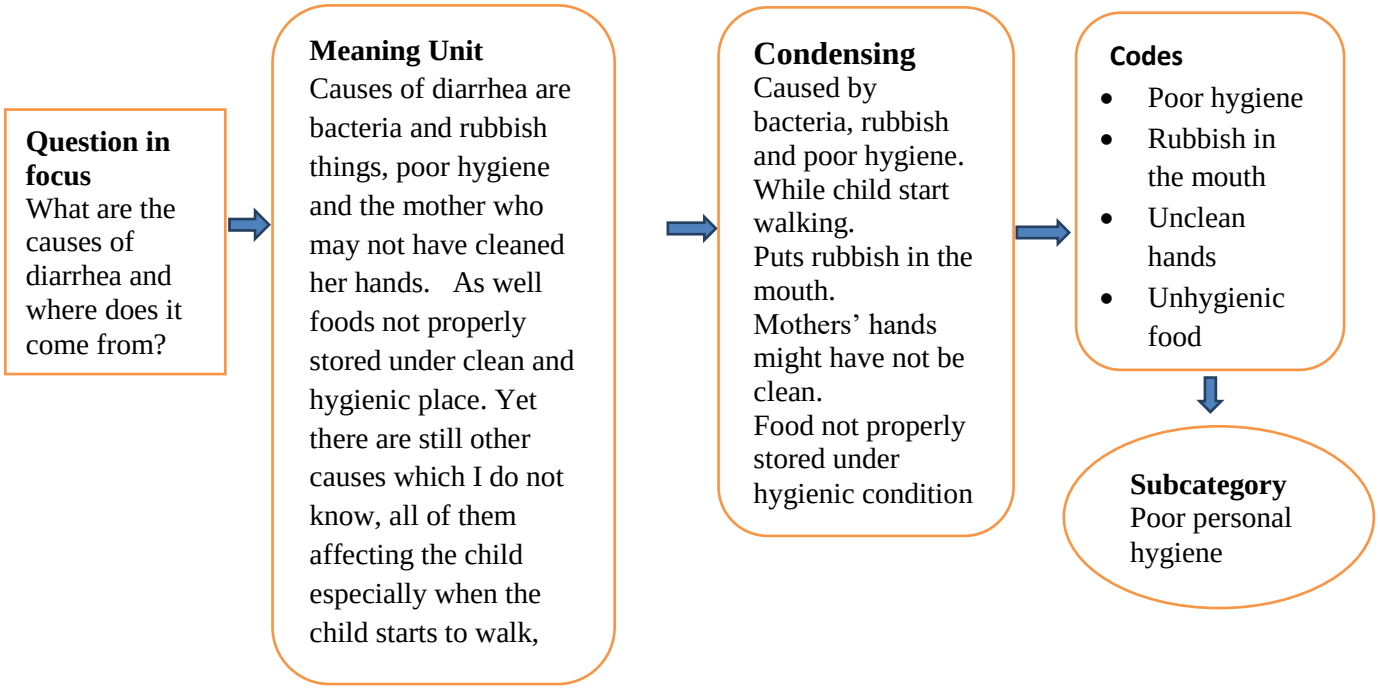

Figure 1. Example of the *coding process moving from meaning unit to a subcategory*

Both Ethical and Research Committee of Puntland University of Science and Technology and the Mudug Regional Health Office of Ministry of Health of Puntland have approved conducting this study in North Galkayo. The research participants have been well informed about the purpose of the study, and had informed consent. The researcher has assured for them, that the information they provided would be confidential and shared only within the research group. They were also aware of their right to withdraw their participation at any stage without notifying reasons (12).

RESULTS

In total 15 mothers were interviewed. All women and were in the age-range from 20-45 years of age. The women represented different socio-economic situations and in Appendix 2 the table gives some details about them.

The analysis resulted in three main themes; *Questioning own knowledge, Welcoming support and Moving from despair to improved self-confidence.* They illustrate what mothers with under-five children that had experienced symptoms of diarrhea knew about the disease, how they responded to it as well as their attitudes towards or experiences from a short intervention. The first theme, **Questioning own knowledge** explains (i) the kind of true beliefs that mothers had before the intervention and how their knowledge could be justified since they all have said "diarrhea is caused by poor hygiene", conversely, their knowledge did not help them to prevent diarrhea from their households. (ii) Furthermore, it clarifies and rules out if other economic and social determinants of diarrhea i.e. Access to clean, safe water, and food security played critical role in impeding diarrhea in North Galkayo.

The second theme, **Welcoming support,** displays how mothers with sick children are connected to the existing health care system in North Galkayo and if there are health education organization, interest groups and peer groups, which provide motivational and educational support to mothers with sick children.

It also illustrates to the fact that mothers were concerned about frequent diarrhea in their children and those that had the intervention strongly supported the short training and were enthusiastic to have learnt how to prevent diarrhea from the training. They showed high degree of interest and practically demonstrated communications conveyed. Main areas of interest were the steps of hand

washing with soap. Critical times of hand washing during the day and the *do's and don'ts*. Those otherwise, who had not taken part in the training urged for future support. The third and last theme, **From despair to increased self-confidence,** indicates that mothers become confident after seeing the effects of their actions and that diarrhea had nearly disappeared from their household since the training. They had realized that a short intervention training caused changes in their family life and saved the lives of their children. They wanted that hospitals and clinics in the country as whole adopt and implement these kind of training sessions. This indicates the possibility for the training to transform knowledge into practical accomplishment in the eradication of diarrhea. Fig.2. Gives an overview of the results and included the categories and sub-categories that support the themes.

All the mothers unanimously mentioned that diarrhea begins from poor hygiene including poor sanitation of food and water, eating with dirty hands and fly contact- a justified belief, but maybe not sufficient knowledge.

> *I mean… it is about what causes watery diarrhea. it is caused by bacteria by which the fly has touched. Yes, the bacteria by which the fly has touched which touched the stool and then touches children's' fingers and thus watery diarrhea comes from the stool (Respondent 4 with training)*

Family with children suffering from diarrhea has great deal of frustration and some mothers have manifested that they had of despair and anger as response to the frequent diarrhea occurrence of children and to the burden of the family responsibility.

> *"Diarrhea is bad and is caused by dirtiness and when my child gets diarrhea at home, for example at night, I become frustrated and in despair. I sometimes feel ashamed when it repeatedly occurs or affects other children. Yes, I go to different doctors and MCHs because I afraid they may yell on me, and people in the next room might hear what he is talking about. (Respondent 1, trained)*

Some of the participants believed that there are other causes of diarrhea, such as cravings from a type of mineral salt i.e. the child was yearning, and then withheld for some time.

> …. "*My neighbors advised me to apply to apply traditional salting practices in the mouth and administer salt in the rectum. This is what we do to children especially when a child has sudden onset of vomiting and diarrhea and that he has been used to traditional salting and we can recognize when the child needs and then we apply in his mouth and rectum. I also*

mix in his milk, sometimes the child gets well and sometimes the child may need to be taken to hospital" (Respondent 9, without training).

In terms of water sanitation, mothers mentioned that there are 3 types of water available in Galkayo and among these types of water, 2 types were filtered water and suitable for drinking. However, all of them mentioned that the pipe water is hard and they talked about concerns that tap water may cause kidney stones and gut motility. When asked access and affordability of water in their respective homes 14 out of 15 had water tap at home, which they use for washing with affordable price of USD 1.2/M^3. For drinking, cooking and milk preparation, they get filtered water from local suppliers on demand. One of the mothers from internally displaced people mentioned that she fetches water from nearby water point with inexpensive price of USD 0.06/20L jerry can. According the respondents, the access, affordability and equity to water was not a problem for them.

"Water in my environment is clean but little bit salty and can bring to you kidney stones. Most houses have tap although it is not cheap we pay 20 dollar per month sometimes more like 30 dollar per month it depends how the person uses" (Respondent 3, with training).

By asking mothers about their experience on diarrhea before attending the training; their answers were gloomy and not unusually experiencing hopelessness and under esteemed, because frequent visit to hospitals due to diarrheal illness seemed pejorative word to some of them.

"My ten year old son was nick named Oday Biiqay the past, this was after he has been frequently sick with diarrhea and then become malnourished, hospital staff called him Oday Biiqay as joking because he was weak and malnourished but mentally bright. Although, I did not like that name for my child but they were so kind for him (Respondent 6, with training)

This was simplified advice or training and yet they have best used the simple skills they acquired and have managed well. On the other hand, those not trained respondents unanimously supported that health education saves lives of the community. One mother added that a trained mother would share that knowledge with her children, relatives and neighbor mothers. Knowing that peer groups influence each other, her thoughts will potentially enhance community participation in health.

....." I conclude that you open places to provide health education to mothers; therefore, this will result in that you have health teacher in every house and will prevent the recurrence of diarrhea. I do not mean only the mother but the mother is the most appropriate and she can train even children when you educate mother she will educate 10 children. INSHALLAH" (Respondent8,without training)

All trained mothers indicated that before the training they felt a lot of fear, distress and guilt when diarrhea repeatedly occurred in their household.

"I often felt frustrated, fear and helpless when my child becomes sick and has diarrhea, I did not know what to do except to take him to the doctor, but when I was trained with appropriate hand washing and saw the effectiveness of this skill that it has eliminated the frequent diarrhea of my children. I become delighted and confident; nowadays diarrhea is very less in my house. MANY THANKS FOR ALLAH" (Respondent 7, with training).

One of mother expressed the agony she had when a health worker pejoratively told her that she is very unhygienic and that is why her children get diarrhea repeatedly. In that day she left from that clinic in despair and went to the main public hospital where she received medical care for her child and was enrolled for short training for the prevention of diarrhea. Her family currently enjoys life without diarrhea for one and half years and she is confident that proper hand washing with soap can eradicate diarrhea to nil.

"There was a time that one of my children who frequently become sick and I always took him to the hospital and then I become famous in the hospitals. One day a doctor told me that my daughter is always sick with diarrhea and it is due to poor cleanness, and added you have to improve your cleanness and that day. I was so annoyed to him. I did not want to see him again. Then some days after that I attended the training, you have given to us with group of mothers. In that day I understood that the doctor was right although in the beginning I thought he was offensive but at least his was telling true. I always wash hands as you have explained to me, and I prevented flies to grow in my house. In addition, I have taken that lesson sincerely and understood without feeling guilty. I learnt lot of many useful things that was what else more I needed from the doctors from door to door I only took medicines.....about 2 weeks later or so of practicing of what I have seen from your lessons and the books you have given to us. I saw the changes and asked myself Oh! When was the last time that one of these children fallen sick with diarrhea? Then I remembered yes it is 2

weeks and then time went like that with no diarrhea. It is about one year and more and no diarrhea illnesses from that day you gave the lessons to us". (Respondent 5, with training)

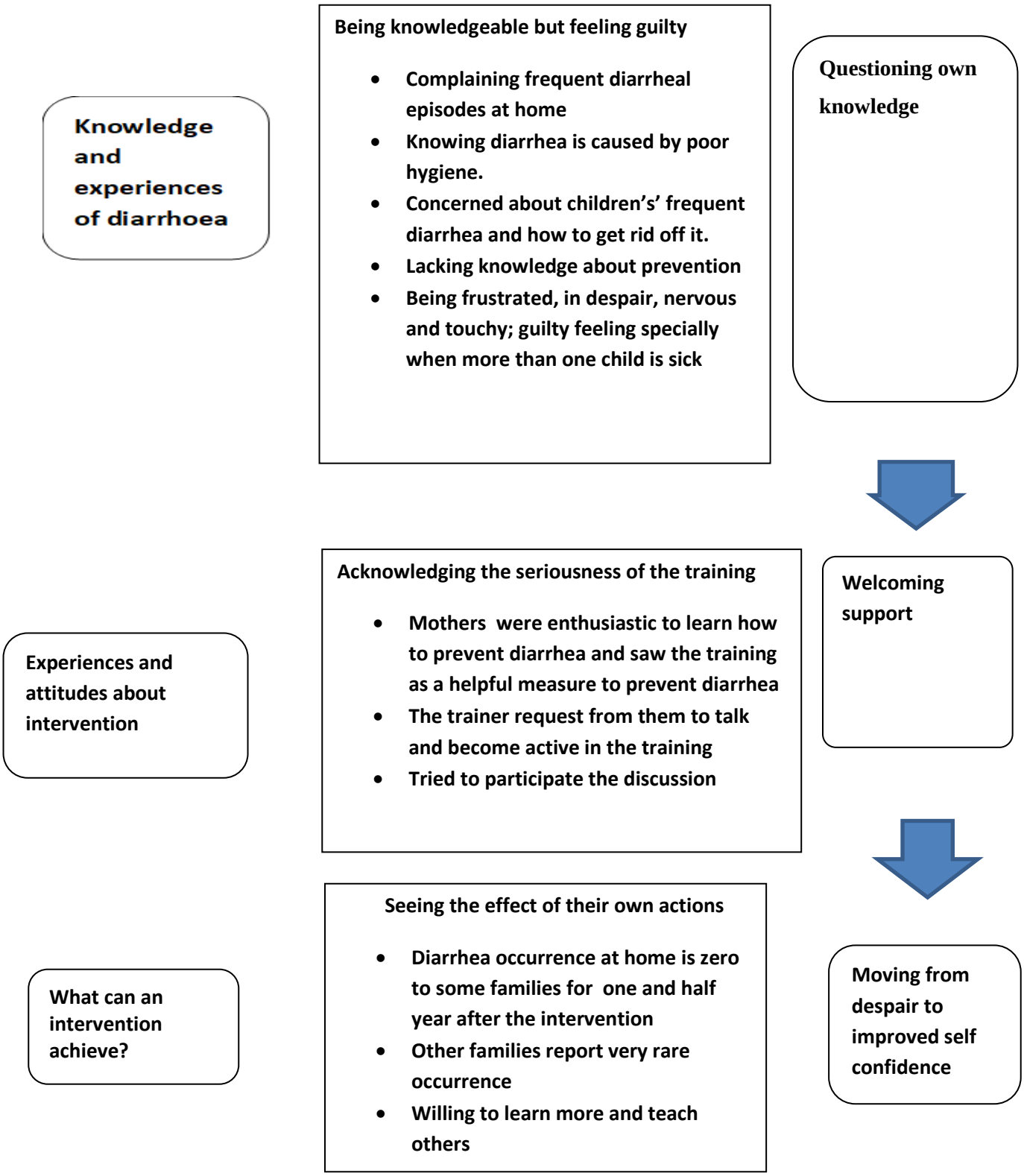

Figure 2. Overview of the main results

DISCUSSION

This study shows how a short training on the prevention of diarrhea can effectively transform the life of families in terms of caring for children with diarrhea and for preventing diarrhea.
In addition, a research group has found in a randomized control trial that; vaccination, ORT, breastfeeding, and micronutrient supplementation are effective in reducing the burden of diarrhea, and that these are cost-effective investments (14). The possibility for behavioral change has also been illustrated in a study from South Africa on smoking cessation, where pregnant mothers received a tailored smoking cessation intervention, which influenced the smoking habits and turned hopeless into competence (15).

Although this research was about pregnant women's response to tailored smoking cessation intervention, it indeed caused an embraced change to the research participants and showed that short interventions can cause effective modification of life style. Other authors have demonstrated that health education training for small groups can eventually yield active participatory learning (16). In nursing literature, the role of teaching is as one of the 7 important roles of the nurse (17). Whenever learning- teaching relationship between the nurse and client increases there will be proportional increase of helping relationship, thus trust and mutual respect are established (17, 18). Other researchers claim that for example improving hand-washing knowledge alone is typically insufficient to change hand-washing behavior. A study conducted in India, have evaluated a hand washing awareness-raising campaign, the Great WASH Yatra, found an increased knowledge about the benefits of hand washing, but had little effect on changing intention to wash hands with soap (19).

The research project, conducted two interviews of groups of mothers. (I) those who had hygiene promotion training to prevent diarrhea; to discover their feelings, perceptions and experiences to diarrhea before and after the intervention. (II) The second group of mothers who did not have the training; the aim was to investigate what health education is like to a mother in North Galkayo of Somalia. To sum up mutually, the convergent point is to capture if both groups of mothers commonly and independently perceive the absence of health education in the health facilities in North Galkayo; and as well their emotional response to a simple and inexpensive short training. Based on the qualitative study there is however a need to conduct quantitative research to be able to measure the effect of such intervention.

The credibility of a qualitative study relies on being able to capture the reality of the informants. In this study the researcher had a prolonged engagement with the participants and other health personnel who were well acquainted with the study setting for instance, clinical nurses who work in the primary health care facilities were interested and proof read the contents of the training materials and commented its relevance. Furthermore, original voices and transcripts are available for audit if needed (20).

Conclusion

This study shows that a simple training with appropriate learning process can turn on and animate cognitive abilities of the decoder (recipient). The recipients of the training although they had their explicit knowledge paradoxically, they complain from recurrent diarrhea before the short intervention. However, later on after the training diarrhea just became a history. The study agrees with many other scholars and researchers who have demonstrated that simple training could be utilized to come over a long-standing health problem.

The study showed that a minimalist action such as short-term intervention could serve if appropriately designed for all levels prevention of diarrheal illnesses. Above all other measures of prevention, educating the mothers and caretakers comes first. The mothers recognized and recommended creating a significant health education component in all levels of health care settings in North Galkayo means empowering the mother to play significant role in the prevention and treatment of diarrhea. This recommendation is pragmatic, practical and simply attainable but drastically a missing link in the North Galkayo clinics both in private and public services.

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Conflict of interest

I here certify that I have not received any fund or benefit from anyone or institution to conduct the study (21).

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Appendix 1

- *How does one get diarrhea?*
- *The F diagram mode of transmission of germs that cause diarrhea,*
- *What is the meaning of dehydration and its degrees of severity presenting with pictures of signs of severe dehydration?*
- *What happens to the patient if not promptly treated?*
- *When to go to hospital?*
- *Encouraging rehydration as best treatment of dehydration and discouraging some traditional ways that do not rehydrate the child or aggravate dehydration.*
- *How to rehydrate child at home by using ORS and homemade fluids (preparing in front of them by using local utensils).*
- *How to prevent diarrhea with systematic and soap hand washing practices (demonstrated in front of them and they practiced and did it).*
- *How to eradicate fly from the house by using available fly control methods including pouring ash in the toilet pit.*
- *How do you prevent diarrhea at home (only for mothers without intervention)*
- *How frequent diarrhea occurs at your environment? (only for mothers without intervention)*
- *What does health education training for the prevention of diarrhea such as hand washing and control of lies mean to you and your family? (only for mothers without intervention)*

Appendix 2

Table.1. Characteristics of interviewees

Age group in years	Number
• 20-25	02
• 26-30	04
• 31-35	04
• 36-40	03
• 41-45	02
Living condition according to Galkayo North	
• Absolute poverty	01
• Relative poverty	06
• Middle level	06
• Business level	02
Access to clean water	
• Have access	14
• Have no access	01
Formal education and literacy level	
• Literate	06
• Semiliterate	04
• Illiterate	05
Employment	
• Employed for government	00
• Self-employed	03
• House wife	12
Marital Status	
• Married	15
• Divorced	0
• Widowed	0