

Translating the Health Belief Model into Contextual Community Intervention: A study on proper hygiene practices of mothers of children with diarrhea

Kwartarini W. Yuniarti

Faculty of Psychology, Gadjah Mada University

Diarrhea remains a serious burden for children in developing countries, and remains a leading cause of childhood morbidity and mortality. The health belief model (HBM) is frequently used in explaining health behaviours. This study used HBM and translated it into community understanding to gain local perspective of mothers of children with diarrhea. A qualitative approach using focus group discussions was conducted. A community model was then developed using local data. Data showed that mothers believe in two kinds of diarrhea: diarrhea as a disease and diarrhea as a part of the developmental process. The contextual community model explain the HBM in a different frame of theoretical explanation model, which was developed in different setting of culture, can not be simply applied in the community without undertaking field verification, as conducted in this study. Detailed results and discussion are presented and proposals for a culture-sensitive intervention approach were proposed.

Key words: diarrhea, HBM, personal hygiene, community model, contextual model

Diare merupakan permasalahan serius di negara berkembang dan bahkan merupakan penyebab utama mortalitas dan morbiditas balita. Health belief model (HBM) sering dipakai untuk menjelaskan perilaku kesehatan. Studi awal ini memakai Health Belief Model untuk mengetahui pemahaman masyarakat tentang permasalahan diare dan perilaku kebersihan. HBM dalam pemetaan teoretis diverifikasi di komunitas untuk menguji presisi model secara kualitatif. Diskusi kelompok terarah dipakai dalam eksplorasi kualitatif. Data menunjukkan bahwa model diare di komunitas studi berbeda dengan model biomedis. Para Ibu memercayai adanya dua jenis diare, diare sebagai penyakit dan diare yang merupakan bagian dari tumbuh kembang anak. Dapat disimpulkan bahwa model komunitas kontekstual berbeda dengan model biomedis. Bahasan terinci disajikan dalam artikel ini. Program intervensi yang peka kultur setempat diajarkan sesuai dengan hasil penelitian ini.

Kata kunci: diare, *health belief model*, perilaku kebersihan, model komunitas, model kontekstual

This article is reporting the first phase, the qualitative phase, of the whole study on the discrepancy between knowledge-related hygiene practices of mothers of under-five children with diarrhea. The second phase, the survey or quantitative part of the study is presented in a separate article. The study was inspired by the burden of disease of diarrhea among children under five, and by the fact that biomedical model frequently failed in explaining local understanding of the disease, and eventually failed in accomplishing prevention of health programs.

Worldwide, acute diarrheal illnesses are not only a leading cause of morbidity in children, producing an estimated 1 million (diarrheal) cases per year, but also the major cause of mortality, being responsible for 4 to 6 million deaths among children under five per year, or a sobering total of 12,600 deaths per day (Sabchareon et

al, 1992; Azar et al, 2009). Morbidity and mortality due to diarrhea remain a serious burden for children in developing countries (Stanton, Black, Engle, & Peltó, 1992; Nathaniel & Pierce, 1997; Elbrusa, Tigerman, & Tom, A. R. E., 1988; Ekanem, Akitoye, Tigerman, Tom, & Adedeji, 1991; Akram & Agboatwalla, 1992; Stapleton, 1992; Pruss, Kay, Fewtrell, & Bartram, 2002; Kosek, Bern, & Guerrant, 2003; Mara 2003; Azar et al.).

In Indonesia, where the Infant Mortality Rate (IMR) and under five Mortality Rate (U5MR) are currently 58 and 81 per 1000 live birth, respectively, diarrheal disease remains a leading cause of childhood morbidity and mortality (UNICEF, 1996; Rai, 1997; Kosek et al, 2003; Mara 2003; Azar et al, 2009). Approximately 15% of deaths among infants and 25% of deaths among children aged between one to four years are caused by diarrhea (Departemen Kesehatan, 1996; Kosek et al.; Mara; Azar et al.). Diarrheas reported as the biggest killer for children aged between two and five at the national level (UNICEF; Kosek et al.; Mara; Azar et al.).

Correspondence concerning this article should be addressed to Kwartarini Yuniarti, M.Med. Sc., Ph.D. Faculty of Psychology, Gadjah Mada University, Jalan Sosiohumanniora, Yogyakarta. E-mail: kwartarini_yuniarti@yahoo.com

Previous epidemiologic studies showed the close association of the prevalence of diarrhea with age and socioeconomic status of the child and hygiene practices (Pelto, 1991; Heatley, 1995; Jensen *et al*, 2002). Poverty, ignorance, illiteracy and over-crowding are all associated with behaviours which might increase the risk of enteric pathogens that cause diarrhea. Combined with poor sanitary conditions and inadequate personal hygiene, these factors lead to an increased incidence of diarrhea and other illnesses in young children (Zaman, Jalil, & Karlberg, 1993; Han, Oo, Midorikawa, & Shwe, 1989; Jensen *et al*; Clasen & Bastable, 2003; Clasen & Mintz, 2004; Wright *et al*, 2004).

It has been documented that the significant reduction of child mortality in developed countries was strongly associated with major improvement in these factors (Pickering, 1985; Motarjemi, Kaferstein, Moy, & Quevedo, 1993; Gorter *et al*, 1998; Curtis, Cairncross, & Yonli, 2000; Larson & Duarte 2001; Sobsey, 2002; Tumwine *et al*, 2002; Lanata, 2003; Abu Mourad, 2004; Al-Ghazawi, 2004; Al-Medhawi, Briggs, & Keane, 2005; Fewtrell *et al*, 2005). Recommendations of the World Health Organisation regarding diarrheal reduction stated that individual behaviour and the environmental conditions (especially water and waste disposal facilities) were two main elements which can be regarded as potential risk factors (Pelto, 1991; Tumwine *et al*, 2002; Lanata, 2003; Abou Mourad, 2004).

Behavioural Risk Factors

Essentially, all methods to reduce diarrheal morbidity and mortality require behavioural change (Stanton, Black, Engle, & Pelto, 1992; Al-Medhawi *et al*, 2005; Fewtrell *et al*, 2005). A number of studies have shown that poor hygiene practices are significantly associated with diarrhea (Bartlett *et al*, 1992; Kunstandter, 1991; M.M. Levine & O.S. Levin, 1994; Motarjemi *et al*, 1993; Gorter *et al*, 1998; Curtis *et al*, 2000; Larson & Duarte, 2001; Sobsey 2002; Tumwine *et al*, 2002; Lanata, 2003; Abou Mourad, 2004; Al-Ghazawi, 2004; Al-Medhawi *et al*, 2005; Fewtrell *et al*, 2005). Nevertheless, although studies on risk factors on research on diarrheal diseases have described the relationship between behaviours and the occurrence of diarrheal disease, the studies have not systematically identified the antecedent factors that precede the behaviour (Pelto, 1991; Bartlett *et al*, 1992; Abu Mourad, 2004; Al-Ghazawi, 2004).

Socio-Cultural Determinants of Diarrhea

In addition to the fact that a strong association between socio-economic status and child diarrhea has been reported previously in different independent studies

(M.M. Levine & O.S. Levin, 1994; Weiss, 1988; Katahoire *et al*, 2004), the aetiology of diarrheawas perceived differently among the various local cultures (Sototo, 1991; Sutra, 1991). This is consistent with the fact that human behaviour is governed by social, cultural and psychological factors (Higginbotham, 1994). A recent study, for example, showed that improving water and sanitation was not enough to stop the transmission of diarrhoeal disease (Armar-Klemesu, Ruel, Maxwell, Levin, & Morris, 2000; Katahoire, Flemming, Sabroe, & Whyte, 2004). An understanding of local people and the awareness of their beliefs regarding the prevention of infectious diseases was required.

It has been acknowledged that many societies have their own classification system for diarrhea, each with its own label, symptoms, cause and treatment for the diseases (Bentley, Pelto, Straus, *et al*, 1988; Dash & Padly *et al*, 2006). It shows that local understanding on the disease is crucially required, should a holistic approach be undertaken to solve the problems. It is not only the disease itself, but the whole context where the disease occurs that needs to be well incorporated in the intervention program to eradicate the target problems.

Indeed, in the analysis of preventive health behaviour in a Southeast Asian Country, it is imperative to take into consideration the influence of ethnic or cultural values and beliefs. The cultural differences among ethnic groups might prove crucial in the perceptions of seriousness and susceptibility to disease (Quah, 1985; Dash & Padly, 2006). Just as there is variation in behaviour, even in a small community, fundamental characteristics of cultural beliefs can also vary across communities (Pelto, 1991; Weiss, 1988; Dash & Padly). The social and cultural context in which diarrhoeal illness occurred has remained complicated; in other words it has been difficult to translate biomedical knowledge into the knowledge of lay people due to their beliefs and understanding which are usually different from the biomedical model (Weiss, 1988; Dash & Padly).

Weiss (1988) stated that health professionals who understand local interpretations of the cause, course and treatment of diarrheal illness performed better and were better able to communicate with the people they serve. They understood how puzzling biomedical explanations might sound to the community and they could explain recommendations for prevention and treatment in a manner that made them acceptable within the context of local beliefs and practices. They could understand the logic of behaviour that was irrational by biomedical standards, the appeal of these behaviours to those who practice them, and the reluctance to relinquish those traditional activities. By

listening attentively and respectfully, attempting to understand the experience of illness, not just its pathophysiology, health professionals build an alliance with the community.

The process of eliciting local perceptions provides a model that may also enhance compliance when health educational programs were introduced and when patients and their families heard recommendations for treatment and prevention. Therefore, health planning of diarrheal disease must be responsive to both epidemiological patterns and local perceptions of health (Weiss, 1988; Dash & Padly, 2006). Previous studies reported that planners of community-based health care programs had to become increasingly aware of the value of cultural information about the constituent populations served by specific programs (Weiss, 1988; Dash & Padly).

There is greater recognition that many problems in primary health care programs are due to lack of knowledge about local health practices, lack of sensitivity to economic and cultural factors, and other elements that require in-depth knowledge about cultural practices and local ecological constraints. The present study suggests that in order to implement an intervention program effectively, we need to understand the behaviour of the people which itself is a function of the culture of that particular place. In order to develop an effective community intervention program, there is a need to understand the different perceptions and behaviours of mothers in relation to diarrhea and hygiene practices in the local community in which the program is to be initiated. If a program is to be effective, it must be both culturally sensitive and relevant to the needs of the community.

The Health Belief Model – A Theoretical Model to Explain Community's Belief and Understanding on Diarrheal Disease

The Health Belief Model (HBM) was initially developed in the 1950s by a group of social psychologist at the US Public Health Service in an effort to explain the widespread failure of people to participate in preventive health programs (Rosenstock, 1990; Bomh, 1991; Quah, 1985; Mullen, Hersey, & Inversion, 1987). This model originally consisted of four underlying domains that regulate individual behaviour. These are: perceived susceptibility, perceived severity, perceived benefit and perceived barriers.

Perceived susceptibility is defined as an individual's personal perception about his/her susceptibility or vulnerability to a given disease. Personal feelings concerning the seriousness of the disease are referred to as perceived severity. It includes evaluations of both medical and clinical consequences (e.g., death, disability, and

pain) and possible social consequences (e.g. the effect of the condition on work, family life, and social relations). Perceived benefit is defined as the belief that any action taken by the person is worthwhile and will prevent disease. Perceived barriers are the last domain and are defined as the subjective anticipation that prevents an individual from undertaking the behaviour.

In 1977, Bandura popularized the concept of "self-efficacy" which is the conviction that an individual will be able to successfully perform the required behaviour that would protect him/her from a given disease. This component has been incorporated into the HBM by Rosenstock (Rosenstock, 1990). Mullen *et al* (1987) stated that from the standpoints of parsimony, specificity, and acceptability, we consider it expedient to improve the health belief model by adding behavioural intention, self-efficacy, and social network components. Self-efficacy reinforces the intention of the person to undertake the behavior (see Figure 1).

Besides these individual factors, a number of studies have shown that diarrheais perceived differently among cultures (Stapleton, 1992; Dash & Padly, 2006). In my own experience, for example diarrhea is perceived as a normal part of growing-up. Some people believe that their child becomes smarter after experiencing diarrhea. This means that the mother does not perceive diarrhea as a serious disease that could cause death. Thus, although the mother knows that improper hygiene practices could cause diarrheashe may not practice the appropriate behaviour due to her belief that diarrhea is not a life-threatening disease, but on the contrary, increases intelligence of the child.

It is the aim of this present study to obtain insight into this problem by taking into consideration the local culture as the main framework. Following is the adapted framework of the HBM. The knowledge in the model is seen and referred to the local understanding of the people which is strongly influenced by the local culture, which will be gathered/ examined during focus group discussions.

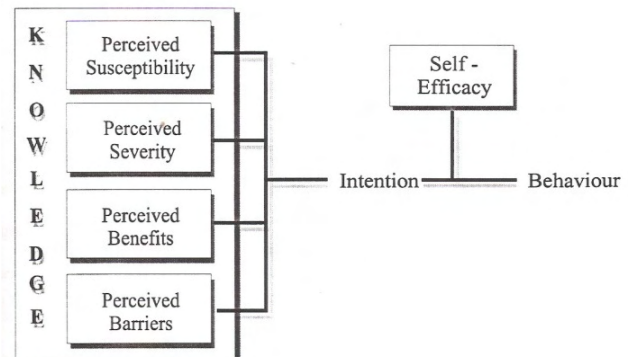


Figure 1. The HBM as applied in the present study

Figure 1. tells us that if mothers have the correct knowledge on the importance of proper hygiene behaviour to prevent their children from getting diarrhea they would perceive diarrhea as a serious disease, they would see their children as susceptible to the disease, subsequently they would perceive that proper hygiene would be beneficial to prevent their children from getting diarrhea and would see relatively low barriers in undertaking the behaviour. These four main domains of the model are all strongly influenced by the local culture and would constitute the intention of undertaking the behaviour. If the mothers have the faith in themselves that they are capable of undertaking the behaviour and overcoming any barriers, this would lead to the actual performance of proper hygiene practices. Aim of the study was to understand the local knowledge and belief regarding diarrhea and diarrheal prevention.

Research Questions of the Study

Research questions of the study are:

- (a) What is the relationship between knowledge and behaviour of hygiene practices in relation to diarrhea among mothers whose children have diarrhea? What are their views of the aetiology of diarrhea among young children?
- (b) What are the factors explaining the relationship, if there is any, between knowledge and behaviour of hygiene practices in relation to diarrhoea?
- (c) How do mothers perceive the severity of diarrhea and the susceptibility of their children to diarrhoea?
- (d) How do mothers perceive the benefits of carrying-out proper hygiene practices and the barriers to undertaking those practices in order to prevent their children from getting diarrhoea?

Methods

This study used HBM and translated it into community understanding to gain local perspective of mothers of children with diarrhea. A qualitative approach using focus group discussions was conducted. A community model was then developed using local data

The Study Subjects

A memorandum from the John Hopkins University and the World Health Organisation (WHO, 1989) declared that semi-structured interviews, and focused group discussions, were of value in describing behaviours that could affect the transmission of diarrheal

diseases and in defining the variables to be included in structured observations. Such methods were also useful for delineating the political, social, cultural, and economic factors that determine which behavioural changes were possible.

Rauyajin *et al* (in press) found that through focus group discussion and participant observation, we gained an in-depth information of mothers' hygiene behaviour and some predisposing and enabling factors.

Mothers of children aged 0 – 36 months were identified from baseline data collected as part of the longitudinal surveillance programme. Lists of mothers from four selected villages were used to select subjects for the focus group discussions. Within each list, two mothers with more than four children, between two and four children, and less than two children, were invited to attend the discussions. Another two mothers who had less than nine years schooling and two with longer/higher than nine years education were also invited. In addition to that, two mothers whose socio-economic background were low and two whose socio-economic status were high, were asked to attend the group discussion. The socio-economic status was reliably determined by the kind of material used for the floor of the house. Floor made of soil and cement reflected low and high socio-economic status, respectively. Approximately 10 to 15 mothers were invited for each focus group discussion in each of the four villages.

Recruitment Process

Respected village leaders and government officers at the sub-districts and village levels were involved in the study to initiate the recruitment process. Lists of names of mothers who would be invited for discussions were provided to them. The invitation was made by the village officers to give a feeling that the meeting was supported by the local key persons. This was considered to be very important to encourage subjects' attendance and involvement in the topic of interest of the study. It was also an attempt to give a sense of worth to the subjects by having them receive an invitation from their local key persons.

Study Participants

Six to nine mothers attended each of the group of discussion. Table 1 show the socio-economic status of the mothers who participated in the group discussions in the District of Purworejo, Central Java Province, Indonesia. Previous studies showed that the knowledge and belief on diarrhea are different among those with high and low social economic status, which may be due to their education

Table 1
Socio-demographic Characteristics of Mothers Participating in the Focus Group Discussions

	Sub-district of Pituruh		Sub-district Gebang	
	Kalikotes Village	Keburuan Village	Winonglor Village	Pakem Village
N	9 mothers	9 mothers	6 mothers	9 mothers
SES	Low	High	Low	High
Place of Discussion	The house of the head of the village	The house of the head of the village	The office of the head of the village	The house of the head of the village

background. Those with low economic status may not be able to effort good education. In addition to that, people with higher social economic status may dominate the lower, and therefore they were separated during the group discussion.

All discussions were carried-out in the village head's houses except for the group of Winonglor which was undertaken in Village Head Office. Years of schooling of the mothers ranged from two to twelve, whilst number of children ranged from two to six.

Development of the Moderator's Guide for the Focus Group Discussion

A moderator's guide was developed for the focus group discussions based on the HBM. This guide was used to lead discussions and make sure that the same topics were covered in all focus group discussions (eg. mothers' beliefs regarding the seriousness of diarrhea among children under five). A draft of the guide was piloted to ascertain the language and sequence of topics conceived in local dialect.

The Focus Group Discussions

Care was assured during the initial part of the focus group discussion to ensure that participants felt involved in the process and to minimize any distance between both the moderator and participants themselves. The assurance of the importance and significance of the results of the focus group was also emphasized not only for the researcher but also for the participants. Participants were encouraged to speak their mind and assured that all opinions expressed were not going to be evaluated, all were worthwhile, and that disagreement between participants was not only to be expected but also to be welcomed. The confidentiality of personal identity was assured. Basically the first five to ten minutes of the focus group activities were used as a warming-up

exercise to facilitate the group discussions. The group discussions were lead and facilitated by professionally trained research assistants.

The first topic covered in the group discussions involved asking the mothers what they usually did when their children had diarrhoea. Local understanding on the concept and aetiology of diarrhea was also ascertained in the first stage of the discussion. This question was followed by how the women linked diarrhea and hygiene practices. Questions on the roles of socio-economic status, educational background, number of children possessed in the family were raised during the discussion to obtain information on how mothers explained the impact of those variables in relation to diarrhea and hygiene practices.

The second set of questions was about severity of child diarrhea as perceived by the mothers. Probes were always used during this part of the discussions, for example:

The main question:

"Do you think diarrhea is a serious problem?"

The probes would be:

"What could be the dangerous signs of diarrhoea?"

"What could happen to a child who has already got diarrhea for four days?"

Susceptibility of their children to diarrhea was also ascertained together with an exploration of how mothers related this perception and to their own actual hygiene practices.

The final topics raised during the focus group discussion was related to the perceived benefits and perceived barriers of carrying out hygiene practices to prevent their children from getting diarrhea. Questions related to self-reported efficacy and intention to follow good hygiene practices were also discussed.

The exact sequence of the questions was kept flexible in order to encourage spontaneity in the flow of discussion. Each focus group took approximately 45 to 90 minutes. The discussion were held at any place which was most convenient for each group. Two group discussions were run in the house of the village leaders, while the other two were held in the local village office. All of the discussions were tape-recorded, then transcribed. Body language of subjects was also noted. Theme categorization was then carried out, open coding and axial coding was also explored to develop community's model regarding diarrhea and hygiene practices (Strauss & Corbin, 1998). Two reliable and professionally trained research assistants were doing the categorization, open coding and working together for the axial coding, prior model development.

Results

Emic Differentiation between the Aetiology and Nature of Different Types of Child Diarrhea

Beliefs concerning the nature and etiology of diarrhea.

All participants believed that there were two kinds of diarrhea which affected children, which classified as being either “illness related diarrhoea” and “growing-up diarrhoea”. These forms of diarrhea appeared to correspond with what could be considered as severe or watery diarrhea in the first instance and mild or moderate diarrhea in the second. Mothers perceived that the second type of diarrhea was a natural part of the child’s development or process of growing up. In some cases, this growing-up diarrhea was even expected to happen by mothers, as this type of diarrhea was thought to make the child more intelligent. This was illustrated in the following:

“... For a child under one year of age, according to our parents, diarrhea is a sign that the child will be more intelligent... you can tell from the morphology of the faeces...it’s like seeds of chili...but when it’s more frequent, and smelled bad, then you can tell that your child is sick....”

The above expression shows that mothers felt they knew how to diagnose whether their children are suffering from illness-related diarrhea or going through a growing-up diarrheal episode.

Data (see Table 2) showed, from what the mothers have stated, that the growing-up type of diarrhea was differentiated from illness-related diarrhea on the bases of morphology and smell of the faeces, the age and activity of the child as reported in Table 2. This is the most important finding from the study which has not been discovered previously. Mothers believed that if their children were active, had a good appetite and had soft and relatively odour-

Table 2

Mothers’ Beliefs in Ascertaining the Two Types of Diarrhea

General Indicators	Growing-up Diarrhea	Illness-related diarrhea
1. Feces:		
Morphology	Seeds of chili very soft, no color	Watery, mucous color: brown/red
Smell	spring Water	Sour
Frequency	Not very often	Countless
2. Physical activity	Active with peers	Not willing to play
3. Appetite	Good	No appetite
4. Age	Under 5	Under 5 (more for under 1)

less stool then they perceived their children as having a “normal” type of growing-up diarrhoea. Therefore, this type of diarrhea did not cause mothers to be in great concern. Some mothers even had a positive attitude toward their children getting this type of diarrhoea. They believed that it would improve the intelligence of their children.

Although mothers believed that growing-up diarrhea frequently occurred in their children, they also believed that there was illness-related diarrhoea. This type of diarrhea was recognized primarily from the colour of the faeces (brown or red), the smell (sour), and sometimes the presence of mucous. In addition to those characteristics, the frequency of defecation was high and the child was weak in conducting their activities with their peers. Children usually looked weak and pale. Illness-related diarrhea appeared to be severe form of diarrhea with their watery or bloody diarrhea with mucous. Mothers were more likely to be anxious and would usually seek medical help when their children suffered from this type of diarrhoea. According to the mothers, this type of diarrhea was also infectious. Other children were not supposed to visit a child with illness-related diarrhea nor look at the faeces of the child with diarrhea as this could also spread the infection.

For both types of diarrhea mothers believed that the causes could be ascribed to factors directly under the mother’s control (see Table 3). However, awareness that

Table 3

Mothers’ Beliefs Regarding the Severity of Two Different Types of Diarrhea and the Susceptibility of Their Children to Each Type of Diarrhea

The HBM Domains	Growing-up Diarrhea	Ill-Diarrhea
1. Perceived severity		
The child	Not severe: Cured by itself, naturally	Weak, pale, lost weight, can cause death
The Mother	None	Headache, feeling unsure
Financial	None	Cost a lot of money (doctor, medicine, transportation, etc)
2. Perceived susceptibility		
Age	Under 5 and 1	Under 5
Frequency	1 per month	Countless
Features of the disease	Unpreventable from God	Rainy seasons from God Born weak
Weather	Not seasonal	Rainy season
Faith	Developmental stages of the child	From God

the kind of food consumed by mothers could cause their children to get diarrhea was only rose in the groups of mothers with high socio-economic status. Mothers with high socio-economic status also stated that during the rainy season children were more susceptible to diarrhea due to a greater number of flies associated with the fruit season and flooding. Mothers stated that the rainy season might cause their children catching colds, subsequently leading to diarrhoea. Mothers of low socio-economic groups did not raise these issues. All of the groups, however, strongly agreed that illness like measles, hookworm, fever, flatulence, and colds were all considered as preceding illnesses of diarrhoea.

Although in general mothers believed in both medical and traditional concepts of the etiology of diarrhea the study showed that mothers more frequently use the traditional point of view. Traditional concepts can be defined as the local understanding of the features of diarrhea among children which are not included in the medical concepts. For example, mothers' beliefs concerning diarrheal transmission and prevention including the idea that diarrhea could be transmitted through looking at the faeces of a child with diarrhea. It was commonly believed that the quality of the mother's breast milk could cause the breastfed children to get diarrhoea.

The quality of mothers' breast milk, to their beliefs, could be poor due to: too much exposure to sunlight, mothers catching a cold, mothers consuming "*kunir asem*" (a traditional drink made of mixture of tamarind and turmeric boiled in water with little palm-sugar), drinking unboiled coconut milk, or eating unhealthy food (mothers did not mention what is meant by the unhealthy food). Malnutrition and preceding diseases such as fever and measles were also identified as a cause of diarrhoea. Although mothers were aware that unwashed fruit might induce diarrhea to their children, they failed to identify that the core of the cause was due to viral or bacterial-related pathogens. Discussion on reasons why mothers remained applying traditional concepts of diarrhea regardless their understanding in the importance of proper hygiene to prevent their children suffering from diarrhea is provided in the discussion chapter.

Perceived Severity of Diarrhea

Perceived severity of the growing-up diarrhea.

As indicated above, mothers did not perceive the "growing up diarrhoea" as a serious disease. It was not seen as a severe disease that could cause disability and death. This was illustrated in the following quotes:

"...Well, if the stool is odourless and the child does not show any weaknesses, the diarrhea requires no

attention from us, it's only a sign of growing-up, we call it "ngengcreti", your child will be more intelligent and it's a self self-limiting disease...."

"... No we don't really need to give medicine or see doctors, they'll recover by themselves naturally...."

Such belief was strengthened by the fact that the child did not appear to show any weaknesses in terms of physical activities, appetite, and willingness to play. Mothers strongly believed that this type of diarrhea was a self-limiting disease. It was believed to require no attention from physicians, nor from health care providers.

Perceived severity of the illness-related diarrhea. In contrast, mothers believed that illness-related diarrhea could result in loss of weight or even in the death of their children. Impact of having a child getting illness-related diarrhea was such that a great deal of the mothers' or other care-takers' daily activities would be all affected. For example, many women described how the illness and time spent for looking after the children reduced the amount of time available to earn money for their daily living, causing even greater concerns. Mothers usually were not able to carry on the regular household works such as washing clothes, cleaning the house and cooking for the family.

There was also additional financial burden from the cost of seeing doctors (including the traveling expenses) and cost of any medicine prescribed. In cases of prolonged diarrhea the extended family also became involved in getting the burden caused by the presence of ill child within the household. It has been observed that in the study site, two or three families occupied the same living compound, including grandparents. This was illustrated in the following expression of a mother during the discussion:

"... Yea... if things get worse ... Then it's worse, and we feel bad.... Others can't go to work ...it's a burden for all members of the family living in the same house.... And in that kind of situation, we need more money for the medicine, transport ... no time to work.... "

Perceived Susceptibility of the Child to Diarrhea

Perceived susceptibility of the child to growing-up diarrhea.

According to mothers who attended the focus group discussions, all children were susceptible to growing-up diarrhea. To them, there was no way to prevent their children from getting diarrhea. For this type of diarrhea mothers were unable to recognize any causative relationship of diarrhea with any factors whatsoever. Children under the age of 12 months were most suscept-

ible, although all children under five were also seen to be at risk. Getting diarrhea once a month was considered normal.

Children were most susceptible to diarrhea when they were beginning to roll over, starting to crawl, beginning to walk and starting to stand-up by themselves. Children older than five years were considered to get diarrhea due to the type of food they consumed. Diarrhea from this age onwards was no longer considered to be a part of growing up. This is illustrated with the following:

“... No...no...no, this type you need not to be worried about because it's a part of growing-up, a sign of “*mundak akale*” (getting more intelligent) and they'll start learning how to walk...some may start crawling. It does happen to everybody (every child), doesn't it... (Others nodding supporting this opinion)”

Perceived susceptibility of the child to the illness-related diarrhea. Children under five years of age were identified as the most susceptible group to this type of diarrhea although mothers believed that children in any age group could suffer from this form of the disease. Those who were born weak were more likely to become unwell than those who were not. This was seen as partly God's will. The rainy season was identified as the most dangerous season for their children getting this type of diarrhoea. This was because of the fruit season associated with a lot of flies; and the garbage and faeces were spread out in the child's immediate environment as a result of flooding.

“...Well it's seasonal (the diarrhea) especially during rainy season...but you know, no one would ever be able to prevent it, sometimes we do not know the cause, but children are all susceptible to ill diarrhea of course...because sometimes we don't know what they eat which can be the cause of ill diarrhea...there are children who were born weak and there are children who were born stronger...Those who were born weak are usually more susceptible to ill diarrhea but I think these are all God's Will”

Perceived benefits of undertaking hygiene practices. In general, after reviewing all the discussions, mothers did not seem to be able to make the link between the importance of proper hygiene practices and preventing their children suffering from diarrhoea.

The importance of washing fruits and vegetable before cooking was raised among both high and low socio-economic status groups. Unclean dwelling, presence of flies in the house, and mosquitos were identified as potential causes of diarrhoea.

Quite apart from issues relating to the actual washing or preparation of food causing diarrhea mothers also believed that certain types of foods could cause diarrhea in their own right. These included green vegetables, sticky black rice, peanut sauce, peanuts, chocolate and hot spicy food. This belief was consistent across both high and low socio-economic status of the mothers.

Perceived benefits of undertaking hygiene practices in relation to preventing growing-up diarrhea. Although mothers were able to understand that poor hygiene could cause diarrhea they were not able to see how good hygiene practices could prevent their children from getting diarrhoea. They observed that children of people who practice hygiene properly were still susceptible to diarrhea (both types). To them, good hygiene was related to the way they conducted their life. So, while they might believe that it was important to follow good hygiene practices, this was part of their general approach to life, rather than any specific attempt to reduce the risk of disease to their children.

Perceived benefits of undertaking hygiene practices in relation to preventing illness-related diarrhea. Mothers who were interviewed somehow had a grasp of the correct knowledge of the relationship between hygiene practices and diarrhea. Mothers were able to understand but they were not able to fully accept the concept of the relationship between good hygiene practices and reducing the risk of their children getting diarrhea. The fact that mothers had observed people practising proper hygiene yet did not guarantee that their children were free from illness-related diarrhea weakened mothers' beliefs in the benefit of undertaking proper hygiene behaviour.

Since mothers understood that causes of diarrhea for both disease types could be due to similar sources, they did not perceive good hygiene was beneficial for preventing their children from getting diarrhea. In addition to the low perceived benefits of carrying-out good hygiene practices, mothers perceived barriers for this particular behaviour as relatively high. This was explained in the following quote:

“...We never know when our children will get diarrhea. Regardless of the parents practicing hygiene properly or not, it comes just like that...then we all worry if things will get worse. I think all children are susceptible to diarrhea isn't that a part of growing-up...”

Perceived barriers to undertaking good hygiene practices. Mothers foresaw many difficulties or barriers to good hygiene practice. These barriers can be classified as either environmental or personal factors.

The environmental barriers perceived by mothers who brought their children to work were, for example, the absence or limitation of water and soap in the field. If water was available at the work-site (dry field of corn, rice, or even in the woods), its quality was often in question. For those who did not bring their children to the work-site, the daily workload did not give sufficient time for practicing good hygiene for their children. For example, some parents had to start working early in the morning before sun rise (before the child was awake) and would return after sun set, thus leaving little time to either the washing or feeding of their children. The caretaker of the child during the mothers' absence was sometimes the siblings who were only a few years older than the child, and who were not aware of the importance of practicing good hygiene.

"...We actually do care about proper hygiene practices, but in the field (the worksite), it is impossible to always practicing hygiene properly,...no water in the forest/wood, neither is soap available..., I don't think people can avoid their children suffering from diarrheaisn't that happens to all children...."

Personal factors were, for example, individual's habit with respect to hygiene practices, the "personality" of the parents and children, and perception toward hygiene practices. Mothers in the focus group discussions said

that practicing good hygiene was a matter of habit and depend on the regular activity of the person. There were parents whose personality was such that they were typically messy and unlikely to engage in any hygiene behaviour consistently. In addition to that, children were difficult to control and it was not always possible to stop them from eating dirty food. It was also a matter of setting up priority in the family/mothers. Several quotes characterize these findings.

"...The child's personality is difficult to control, they usually do whatever they want to do including eating whatever they want to eat regardless of whether it's clean or dirty...."

"... It's also a matter of whether their parents prioritise health and proper hygiene in their family..., some mothers do not care about this (health and proper hygiene practice)"

Developing a Community Model to Explain Good Hygiene Practices

Using the insights gained from the focus group discussions, a theoretical model of the determinants of good hygiene practices was developed. Within the framework of the HBM, the perceived benefits and barriers of undertaking good hygiene practices seemed to

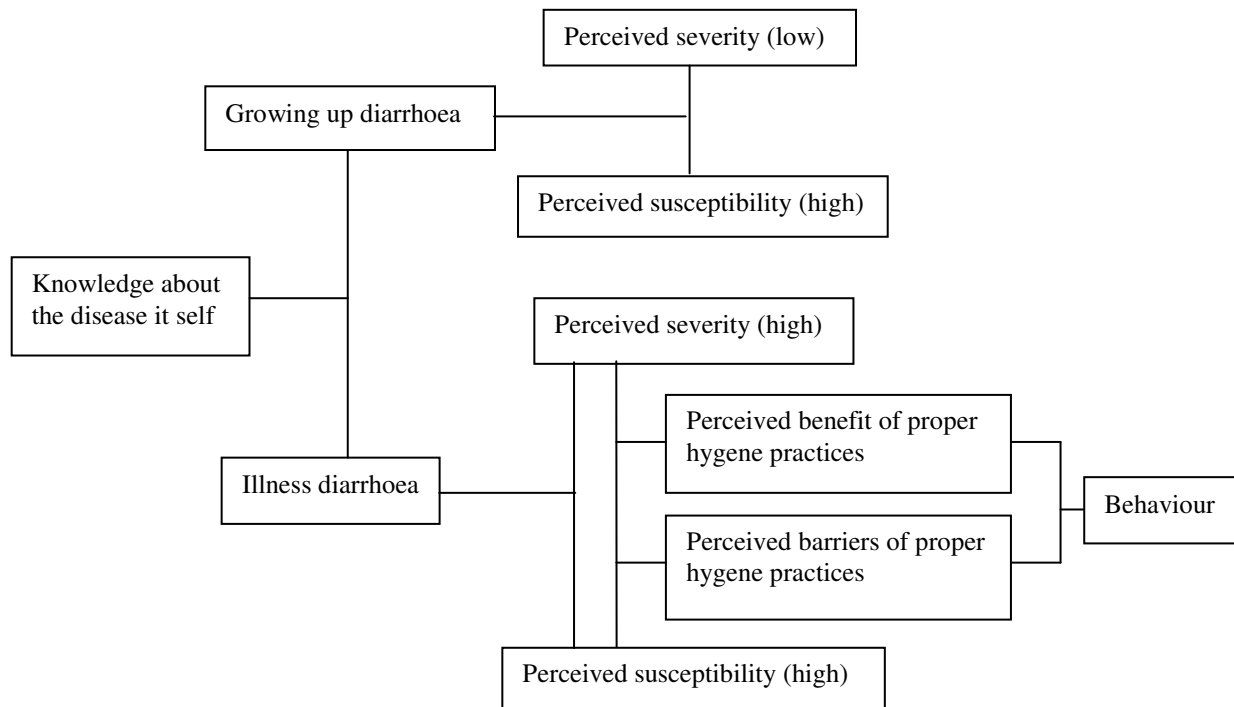


Figure 2. Community-based theoretical model

be the most important predictors. The culture, which is expressed in the knowledge and beliefs, shows the following model in Figure 2.

Intention and self efficacy, as it was constructed in the original HBM, was not responded, neither mentioned, by the study participants during the focus group discussion, and therefore was omitted in the local or community model. The empirical data was not reporting any wording or expression related to intention and self-efficacy. It is probably due to the different cognitive scheme and management of the “West and East” perception. This assumption, however, should be verified in the field for the future study.

Mothers appeared to have great difficulty accepting the concept that there was a link between hygiene practice and either “growing-up” or illness-related diarrhea. Mothers believed that the benefits of undertaking good hygiene practice in order to prevent diarrhea were very low. They believed that diarrhea was not a preventable disease, not even by practicing hygiene properly. The above model is very important to gain insight to know why mothers behaved in such ways in handling diarrheal prevention.

So, unless individual mothers believed that good hygiene was worthwhile to reduce the risk of their children getting diarrhea they would never carry out good hygiene for that purpose. Although it was observed that a mother was cleaning the house, this did not mean that she believed in diarrhea prevention. It was something that mothers normally do; in other words, cleaning the house was a part of the regular housework.

Conclusions

Mothers believed that there were two kinds of diarrheas, growing-up and illness-related diarrhea. Whether or not mothers undertake proper hygiene, they believed their children remained susceptible to diarrhea, and both types of diarrhea were not preventable. Although mothers acknowledged the importance of proper hygiene practices, they perceived relatively little benefit of undertaking proper hygienic behaviour because it would not ultimately prevent their children suffering from diarrhea. In addition to the lack of benefit of proper hygienic behaviour, mothers perceived a number of barriers to undertaking such behaviour. The study concluded that there was a discrepancy between knowledge of the importance of proper hygiene practice to prevent children from illness-related diarrhea and the observed practicing of those behaviours among mothers of children in Purworejo District.

During interviews, mothers stated that diarrhea occurred more frequently during the rainy season. However, they failed to make the link between this season, the fruit season and flooding, and the greater number of flies existing at that time. Instead, they were more concerned with conditions such as colds and flatulence that might cause diarrhea. Had the mothers realized that flies could cause diarrhea they would have taken action to reduce the risk of their children suffering from diarrhea.

The knowledge-practice discrepancy did not arise from a failure on the part of the mothers interviewed to know the nature of appropriate hygienic behaviour and the value of preventing diarrhea. Rather, the discrepancy appears to be due to the fact that such knowledge did not outweigh their judgment that proper hygienic behaviour did not actually produce the benefits of reduced diarrhea episodes combined with an overwhelming sense of potential barriers that hinder the mothers from carrying out these hygienic practices.

Implications of the Study for a Culture-Sensitive Prevention Strategy

Based on the local community’s explanation of hygiene practices and diarrhea among children under five in the study site, the following recommendations are offered for developing an effective cultural and social intervention program.

(1) It is vital to actively involve the mothers. Mothers should be directly involved in the process of developing the intervention, such as in the development of posters or flipcharts for health education. Mothers were encouraged to contribute their ideas about how to develop attractive graphs and pictures. From their perspectives, what are the most attractive and important messages for the media, such as humour, familiarity of models in the media, or any significant others. After drafts of the posters and flipcharts are developed, mothers can be asked to give comments. After incorporating mothers’s comments, they could be asked to explain the media to other mothers. This will allow mothers to not only learn cognitively from the content of the health education, but also to learn affectively (this referring not only to the emotion but also the belief of the mothers), by being directly involved in the process of developing material and programs of education. This will also ensure their relevance to the local community. This approach is consistent with Ekanem, Akitoye, Tigerman, Tom, and Adedeji (1991) who state that diarrhea control programmes are likely to be more effective if consideration is given to behavioural, sociocultural and economic cir-

cumstances of an individual country, community or groups of communities before embarking on any intervention strategy. The health education messages, according to Zaman, Jalil, and Karlberg (1993) can, however, modify the child care practices and the immediate hygiene status, even when the housing standard is poor. The focus of intervention, according to Henry, Huttly, Patwary, and Aziz (1989), should therefore be on changing behaviours to improve overall hygiene.

(2) It is crucial to show explicitly to caretakers of the children that illness-related diarrhea is a serious disease. At the same time, educators (whether local health providers or mothers assigned to undertake the activity) need to acknowledge the existence of growing-up type of diarrhoea. Medical concepts are introduced in relation to local beliefs only when it is necessary as Zaman, Jalil, and Karlberg (1993) did in Lahore, Pakistan, to improve child-care practices and the hygienic environment for the child with a great awareness and focus on maternal literacy and simple health messages. The intervention should highlight mothers' interpretative processes as they seek to make sense of childhood diarrheal episodes that appear resistant to usual treatment and loom as potentially grave and life-threatening disorders (Ekanem *et al.*, 1991; Pylypa, 2009).

(3) Efforts to control disease and improve health in developing countries require increasing collaboration between social and medical scientists (Berman, Kendall, & Bhattacharyya, 1994). This collaboration should extend from the early stages of technology development to the evaluation and improvement of population-wide interventions. As Weiss (1988) and Pylypa (2009) suggested, an appreciation of local cultural models and the diversity of cultural contexts enable health professionals to (a) recognize the significance of local perceptions of diarrhoeal illness with respect to pertinent outcomes and perceived needs; (b) develop ways to introduce recommendations that communities will accept; and (c) make appropriate use of existing community resources representing local traditions, such as using local belief and asking local people in developing the program. It has been emphasized that preventive health care programs may be more sensitive to the effect of cultural attitudes to health and sickness because the demand for preventive health care is weaker than the demand for curative care (Rahardjo & Corner, 1990; Pylypa, 2009). Further it was stated that cultural attitudes play an important role in the determination of demand, the more critical role of demand in successful implementation of preventive health care programs lead to a greater need to accommodate cultural attitudes to health and sickness in

the design and implementation of such programs. It suggests that an explicit demand-focused approach to the role of cultural attitudes to health and sickness offers a practical guide to the identification of specific cultural attitudes that may have a strong impact on a particular health intervention.

(4) Stories could be written using epidemiological data to introduce the concept of risk, and make it clear that there is a significant difference between risk and absolute causation. Villages with high and low incidence of diarrhea could be contrasted and the local mothers' practices in proper hygiene illuminated. Information on this can be gathered from local health services. Such health planning of diarrheal disease is responsive to both epidemiological patterns and local perceptions of health (Weiss, 1988; Dash & Padly, 2006). Raayajin *et al.* (in press) found that effective health education media and methods recommended by the villagers included group discussions, posters, and manual or book presentations. The participants in group discussions should include not only mothers, but other child caretakers as well. Videotape presentations on this topic can be organized prior to the group discussions. Posters can be displayed at local village stores, and manuals or books may contain appropriate simple, self-explanatory visual aids. Interesting photographs of village scenes that convey key messages may be quite effective. The media should take advantage of the local explanatory models regarding the diseases as depicted in Figure 2.

Bomh (1991), in his research on the use of the HBM, stated that although chronic patients were generally more compliant than acute patients, the HBM interventions were equally effective in increasing compliance in both groups. Patients who were more likely to regard the potential consequences of their illness as serious showed greater compliance. Therefore, in the use of the HBM for developing an intervention, the focus should be allocated to the seriousness of illness-related diarrhea in addition to the need for mothers to be aware of the potential danger of the growing-up type of diarrhoea. Similarly, the intervention model should take into account the "personal" as opposed to the "general sense of risk regarding their child's susceptibility to severe diarrhea."

(5) Results from the fieldwork about mothers' perceived barriers in undertaking hygiene behaviour should be shared widely within the community. Such widespread information is necessary to enable mothers to understand the logic of behaviours that were irrational by biomedical standards, the appeal of these behaviours, and the reluctance of some to relinquish them. By listening attentively and respectfully, and attempting to under-

stand the experience of illness episodes not just its pathophysiology, health professionals are able to build an alliance with key persons in the community. The development of preventive programs aimed at changing behaviour can be enhanced by information about the conditions and characteristics that facilitate or constrain appropriate (risk reduction) behaviour (Pelto, 1991; Barreto *et al*, 2006).

(6) Environmental intervention

(a) Water purification techniques taught to mothers (e.g., seeds of *Moringa Oliefera* used to coagulate the water).
 (b) Involve policy makers in drafting proper hygiene and environmental sanitation related policies. This was initiated at the beginning of the study as one of the researches is a local health officer.

(7) Social marketing

Social marketing principles are suggested as a basis for undertaking the intervention. Local health providers and other stakeholders in policy making would be viewed as secondary and tertiary targets while the mothers themselves would be the primary target of the intervention. The study subjects, grouped according to their level of priority as “targets” for the intervention and associated outcomes (“products”), are listed below:

- (a) Primary target: Care takers (mothers and siblings of the children under five).
 Expected product: Increased practicing hygiene properly.
- (b) Secondary target: Local health providers, cadres, or key persons in the community.
 Expected product: Sustainable responsibility of undertaking the program.
- (c) Tertiary target: Policy makers in the district health office.
 Expected product: Hygiene and sanitation related policies.

A theme running through the recommendations above is that the significant local stakeholders, especially the care-takers themselves, need to be involved personally at each stage of the research and intervention process. The best way to ensure that this occurs is to use a “participatory action research” approach, in which the traditional power relationship between the researcher and community subject is reversed, or at least made more equal (e.g., Smith, Willms & Johnson, 1997; Nickson, 1993; Barreto *et al*, 2006). Encouraging local participants to become involved in self-reflective inquiry will ideally improve the rationality and justice of their own social and educational practices (Kemmis and McTaggart, 1998; Barreto *et al*, 2006). In context of such partnership, program priorities and measures will emerge to successfully address both biomedical considerations, which health care professionals recognize as critical, and local concerns, which the community considers paramount (Weiss, *et al*, 1988; Barreto *et al*).

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