

## **HYGIENE AND HEALTH CONDITION OF CHILDREN FROM NETRAKONA BANGLADESH AMONG GARO AND NON GARO COMMUNITIES**

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**ABSTRACT:** A survey was conducted to investigate the potential factors of food-hygiene practices of mothers on sanitation and health condition among children of Netrakona Bangladesh in Garo (tribal) and Non Garo communities. The food-hygiene practices included hand-washing, method of washing utensils, separation of utensils for raw and cooked food, and the location where foods were prepared for cooking. A face-to-face interview was conducted, and data on 270 household were analyzed. The risk of unhygienic system was significantly higher among children. The mothers of targeted area prepared food by cooking in unhygienic kitchen, improper hand washing and mothers preparing food for their children in common utensils. These results indicate that food-hygiene practices are more common in Garo community than Non Garo. This has a potential impact in preventing diarrhea/diseases among children of Non Garo community.

**Keywords:** Hygiene; Sanitation; Health; Netrakona; Garo and Non Garo; Bangladesh

### **INTRODUCTION**

Hygiene promotion empowers people to prevent disease. It is the process of influencing people's knowledge, attitudes and practices, and an agency's knowledge and resources which together enable family members to avoid risky behaviors related to water use, waste and excreta disposal and cleaning habits. (Almedom, *et al.*, 1996). Hygiene is a complex subject. Whilst hygienic practices play a fundamental role in the prevention of infectious disease, they also serve other needs. Amongst these are the desires to create order and beauty and to demonstrate respect for social morality (Curtis, 1998). Whilst hygiene promotion is increasingly favoured by policymakers because of its potential to deliver reductions in diarrhoeal diseases at low cost, such interventions are often 'foggily formulated' (Burgers, 1988). 'Good' hygiene, in the moral sense, is confused with 'safe' hygiene in the epidemiological sense.

Furthermore, previous studies have shown that several food-hygiene factors are associated with diarrhea among children. For example, results of a prospective cohort study in Turkey showed that infants whose houses did not have a kitchen were more likely to suffer from diarrhea (Etiler, 2004). Similarly, children in Nigeria who lived in households with a private kitchen had lower incidence rates of diarrhea than those whose households had no such kitchens (Oni, 1991). Results of a case-control study in Brazil showed that owners of refrigerators were more likely to have a lower rate of diarrhea among children (Heller *et al.*, 2005). The hand-washing practice of mothers before food preparation was

also associated with a lower risk of diarrhea among children (Gorter *et al.*, 1998; Alam *et al.*, 1989). The prevalence of diarrhea among children was significantly higher in families where mothers less often washed their hands before feeding children in a case-control study in Viet Nam (Alam and Wai, 1991). For children's practices, eating food that had been placed on the floor was significantly associated with persistent diarrhea in a case-control study in Myanmar (Nguyen *et al.*, 2006). The cleanliness of kitchen-floor was significantly associated with the prevalence of diarrhea among children in Nicaragua (Gorter *et al.*, 1998). Inadequate food hygiene is considered to be one of the major contributors to diarrhea. Up to 70% of diarrhea episodes in developing countries are regarded as food-borne (Khin *et al.*, 1991; WHO, 1996; Esrey, 1990). Weaning food given to children in West Africa (Motarjemi *et al.*, 1993; Barrell and Rowland, 1979; Molbak *et al.*, 1989), Bangladesh (Black *et al.*, 1982), and Peru (Black *et al.*, 1989) contains substantial amounts of bacteria. Improving domestic hygiene practices is potentially one of the most effective means of reducing the burden of diarrhea in children (Curtis *et al.*, 2000). However, health education and hygiene promotion programs can only be successful if they are based on the current level of knowledge, perceptions, and practices of mothers with respect to child diarrhea and hygiene (Hussain, *et al.*, 2012). The objective of this study was to investigate the potential factors of food-hygiene practices of mothers in the home on the prevalence of disease among their children in Netrakona Bangladesh among garo (tribal) and non garo communities

## **MATERIALS AND METHODS**

**Areas of study and sampling procedure:** The areas selected for this study are different villages of four Unions of Kalmakanada Upazila under Netrokona Bangladesh. The tribal (Garo) and non tribal are predominantly living in this area. Some are involved with agricultural practices, such as crop farming (especially cassava, yam and plantain), vegetables, poultry and livestock, mostly small ruminant animals.

**Sampling procedure:** The population targeted for the study comprised the family tribal (Garo) and non tribal families To be eligible for inclusion in the survey, each prospective respondent was required to have resided in the study area for at least five years continuously. Netrokona one of the District of the Bangladesh where the tribal people were concentrated) was randomly selected as the study area. A multistage sampling procedure was adopted (Theodosy, *et al.*, 2011).

**Selection of household:** In each of the purposively selected communities, total two hundred seventy households were selected using systematic random sampling to represent four Unions from tribal (Garo) and non tribal families. Households were randomly selected from the four Unions.

**Selection of respondents from households:** At least one respondent was selected which must have attained the children. This sampling option was considered expedient in the absence of valid and comprehensive sampling frame in each zone. This approach was found to be culturally expedient and ensured maximum cooperation of members (Yates, 1971; Asika *et al.*, 1991).

### **Instrument for Data collection**

**Questionnaire method:** Demographic information was collected using structured household questionnaire while the non-demographic characteristics were by interview (Hussain, *et al.*, 2005).

## **RESULTS AND DISCUSSION**

**Type family, number of family members, number of children:** The peoples of this area from both communities prefer to live in nuclear families. The results are presented in Table 1 which showed that 95.6% of Garo families and 94.4% of Non Garo families were nuclear family. The results regarding the family size of the Garo and Non Garo communities are presented in Table 1 which showed that the highest percentage, 38.9% of Garo and 15% of Non Garo had 5 family members. Again 23.3% of Garo and 19.4% of Non Garo had family members of 4. While 15.6% of Garo and 21.1% of Non Garo had family members of 6, 11.1% of Garo and

16.1% of Non Garo had family members above 7 and 3.3% of Garo and 21.1% of Non Garo had family members of above 7. Only 7.8% of Garo and 7.2% of Non Garo families had family members of 3. 5. The findings about the number of children of each Garo and Non Garo family are given in Table 1. This shows that the highest percentage, 43.3% of Garo and 35.6% of Non Garo families had 3 children and 23.3% of Garo and 25.6% of Non Garo families has 2 children. 15.7% of Garo and 11.1% of Non Garo families had only one child, 11.1% of Garo and 22.2% of Non Garo families had 4 children. Only 6 families of Garo and 10 families of Non Garo had children 5& above. The findings about the occupation of the mother's of children shows that 92.2% for Garo and 97.8% for Non Garo mothers were House wife, 4.4 % of Garo and 1.1% of Non Garo mothers were service holder and only 3.3% of Garo and 1.1% Non Garo were doing others job (Table 1). The Table 1 also shows the opinion of mothers about their children physical condition. It was found that 34.4% of Garo mother and 40.6% of Non Garo mothers said that the physical condition of the children were poor, while 28.9% of Garo and 40% Non Garo mothers said fair, 33.3% of Garo and 18.3% of Non Garo mothers said good. Only 3.3% of Garo and 1.1% of Non Garo mothers said that child's health were excellent.

**Hygiene and sanitation:** It was found from the Table 2 that the sanitation system of kitchen of both Garo and Non Garo was poor. Again 56.7% of Garo and 69.4% of Non Garo households had poor sanitation, while 18.9% of Garo and 20% of Non Garo households had fair type of sanitation system and Table 2 also shows that 24.4% of Garo and 10.6% of Non Garo households had good sanitation. It was found that 73.3% of Garo respondents and 91.1% Non Garo respondents washed hand after coming from work/ outside of the home. The Table 2 shows that 71.7% of Garo mothers and 76% of Non Garo mothers washed the served plates before and after feeding of their children. This Table 2 shows that most of the Garo and Non Garo mothers used bowl, spoons etc which were only for their babies. It was found that 67.4% of Garo and 75% Non Garo mothers said they used separated spoons; bowl etc for the feeding of the babies.

**Health and medical care information:** The Table 3 shows the opinion of mothers about their children physical condition. It was found that 34.4% of Garo mother and 40.6% of Non Garo mothers said that the physical condition of the children were poor, while 28.9% of Garo and 40% Non Garo mothers said fair, 33.3% of Garo and 18.3% of Non Garo mothers said good. Only 3.3% of Garo and 1.1% of Non Garo mothers said that child's health were excellent. It was found from the Table 3 only 24.4% of Garo children and 17.2% of Non Garo children suffered from any diseases within last two weeks. It appears that the percentage of suffering

from any diseases among Non Garo is higher than that of Garo children. The percentage of suffering from any diseases within last one month was 78.3% and 53.3% for Non Garo and Garo respectively. Table 3 shows that most of the children (50% for Garo and 43.3% for Non Garo) suffer from cough since last one month. Furthermore 27.1% of Garo and 41.8% of Non Garo children suffered from fever, 10.4% of Garo and 5% of Non Garo children suffered from fever & cough. Only 6.3% of Garo and 4.3% of Non Garo children suffered from diarrhea. Most of mothers took advice of the doctors during sickness of the babies. It was found that 88.9% of the Garo mothers and 92.8% of Non Garo mothers took advice of the doctors if the babies had fallen sick. From the Table 3 we found that about 65% of Garo households and 61.1% of Non Garo households treated their babies in private clinics during illness. While 25% of Garo and 29.9% Non Garo children were treated by village doctor. Only 8 of Garo and 15 of Non Garo children got treatment by government hospital & specialist doctors.

We find the above observation people of this area living in nuclear family system and they have small number of family member and mostly women are working as house wife and prefer to care your children and family member, males involved in doing out door activities. Hygiene standard among both communities was not good. The variation in hygiene standards between households was related to the socioeconomic status and the educational level of the mother (Malik *et. al.*, 1992). The hygiene education may be more important once the latrines have been established. Also, a successful implementation of sanitation and hygiene promotion would require community participation at all stages with special emphasis on women as advocated by Jamal (1998). Good food hygiene in the kitchen can reduce the risk of infection from foods contaminated with food borne pathogens derived from food handlers and illness due to bacterial toxins. Control of cross-contamination is key to reduction of food borne disease in both commercial and domestic kitchens. By raising awareness of food hygiene in the commercial catering and domestic sectors through promotion and reinforcement of tailored precautionary messages, food handling errors and outbreaks of food borne disease may be reduced (FSA, 2001). But the kitchen system of people of this area was poor mostly infection come from this unhygienic system. In doing this we recognize that consumers perceive the home to be the least likely source of food poisoning. Proper hand washing is one of the most effective ways of preventing the spread of diseases. Pathogens cannot be seen on hands, and water alone is not always sufficient to remove them. Less number of respondents prefers the proper hand washing. Soap and wood ash are both cleansing and disinfecting agents when used with water and can be used to kill pathogens on hands and utensils. In a few households the plates and spoons used for

serving food were not properly washed after previous use, and this may contribute to post cooking contamination of the food. In the 65 households where children were fed during household meal in their own utensils, all household members washed their hands (without soap) in one bowl of water before eating. This fairly common practice may contribute to food contamination in a number of ways. For example, pathogens present on hands of infected household members can be transferred to those who subsequently dip their hands in the water, including those feeding children (Schmitt, 1997). In all households we studied that had no standard sewage disposal facilities. The children defecated in and around the premises; in two of the households the children were ill with diarrhea. Even in homes with adequate sewage disposal facilities (e.g. pit latrines), the facilities were not adapted for children's use. This contributed to indiscriminate defecation in and around the premises, and thus increased the risk of handling excreta by parents and caregivers, and by the children themselves. This behaviour reflected the children's limited knowledge of hygiene, and is an important public health issue, since such children are at greater risk of faecal-oral infections. Households may regard children's faeces as innocuous (Traore, 1994), but evidence suggests that they are as hazardous as those of adults and may contain high concentrations of pathogens (Benneh, 1993). Outdoor defecation by children and adults can contaminate water sources and may explain the high levels of pathogens in nearby streams. The relationship between household socioeconomic characteristics and childhood diarrhea has been amply demonstrated in the literature (Alam, 1995; Ketema, 1997). For example, using educational level of the parent/caregiver and availability of household amenities as proxies for socioeconomic status, it is apparent that most of the households were relatively poor. In 16% of the households, the parents/caregivers had no school education, and in 38% of households they had only attended primary school. This has significant implications for child health in general (Ehiri, 1993) and for food hygiene behaviour in particular (Ekanem, 1991). Education is also related to employment and income (Togunde, 1999; Cerrutti, 2000) which influence access to household amenities and facilities, including those related to food hygiene and environmental health (Ehiri, 1993). In conclusion, the results of this study suggest that food-hygiene and sanitation practices among mothers of both communities in the home had a potential impact on the prevention of food borne illness. The improvement of food-hygiene and sanitation practices of both communities could be an effective strategy to prevent diarrhea/diseases among children. Further investigation and evaluation studies are needed to document other means of improving food hygiene and sanitation to prevent diarrhea/diseases in different cultural settings.

**Table -1. Characteristics of family, children and mothers.**

S. No	Response	Garo		Non Garo			
		Frequency	Percent	Frequency	Percent		
1	Type of family	Nuclear family	86	95.6	170	94.4	
		Joint family	4	4.4	10	5.6	
		Total	90	100.0	180	100.0	
2	Number of family members	Three	7	7.8	13	7.2	
		Four	21	23.3	35	19.4	
		Five	35	38.9	27	15.0	
		Six	14	15.6	38	21.1	
		Seven	10	11.1	29	16.1	
		> Seven	3	3.3	38	21.1	
		Total	90	100.0	180	100.0	
		3	Number of Children	One	14	15.5	20
Two	21	23.3		46	25.5		
Three	38	43.3		64	35.5		
Four	10	11.3		40	22.2		
Five	06	5.5		09	5.0		
> Five	01	1.1		01	0.5		
4	Occupation of mothers	Service		4	4.4	02	1.1
		House wife		83	92.2	176	97.8
		Others	3	3.3	02	1.1	
		Total	90	100.0	180	100.0	
5	Infant's physical condition according to their mother's opinion.	Poor	31	34.4	73	40.6	
		Fair	26	28.9	72	40.0	
		Good	30	33.3	33	18.3	
		Excellent	03	3.3	02	1.1	
		Total	90	100	180	100	

**Table- 2. Washing, hygiene and sanitary conditions of families of survey area**

S. No	Response	Garo		Non Garo		
		Frequency	Percent	Frequency	Percent	
1	Hand wash practices after coming from outside.	Yes	66	73.3	162	90
		No	24	26.7	18	10
		Total	90	100	180	100
2	Sanitation system of their kitchen	Poor	51	56.8	125	69.4
		Fair	17	18.8	36	20
		Good	22	24.4	19	10.6
		Excellent	00	00	00	00
		Total	90	100	180	100
3	Washing of served plates before and after feeding.	Yes	33	71.7	76	76.0
		No	13	28.3	24	24.0
		Total	46	100.0	100	100.0
4	Use of personal bowls, spoons etc for their babies	Yes	31	67.4	75	75.0
		No	15	32.6	25	25.0
		Total	46	100.0	100	100.0
5	Any diseases within last two weeks	Yes	22	24.4	31	17.2
		No	68	75.6	149	82.8
		Total	90	100.0	180	100.0

Table-3. Health and health care condition in survey area

S. No	Diseases	Garo		Non Garo		
		Frequency	Percent	Frequency	Percent	
1	type of diseases, the infant suffered since last one month	Fever	13	27.1	59	41.8
		Vomiting	0	0	6	4.3
		Diarrhea	3	6.3	6	4.3
		Cough	24	50.0	61	43.3
		Fever& cough	5	10.4	7	5.0
		Vomiting & cough	2	4.2	1	.7
		Fever & diarrhea	1	2.1	1	.7
		Total	48	100.0	141	100.0
2	Taking advice of doctor if the baby falls sick	Yes	80	88.9	167	92.8
		No	10	11.1	13	7.2
		Total	90	100.0	180	100.0
3	Advice provider, if the baby falls sick	Private clinic	52	65.0	102	61.1
		Govt. hospital	7	8.8	12	7.2
		Specialist	1	1.3	3	1.8
		Village doctor	20	25.0	50	29.9
	Total	80	100.0	167	100.0	

### REFERENCES

- Alam, N. and L. Wai. Importance of age in evaluating effects of maternal and domestic hygiene practices on diarrhoea in rural Bangladeshi children. *J Diarrhoeal Dis Res* (9):104-110 (1991).
- Alam, N. Predictors of diarrhoea in young Bangladeshi children. *Journal of Tropical Paediatrics* 41 (5): 278–280 (1995).
- Alam, N. Wojtyniak, B. Henry, F.J. and M.M. Rahaman. Mothers' personal and domestic hygiene and diarrhea incidence in young children in rural Bangladesh. *Int J Epidemiol* (18):242-247 (1989).
- Almedom, A.M. Blumenthal U, Manderson L, Hygiene Evaluation Procedures: Approaches and methods for assessing water and sanitation related hygiene practices, Herndon IT Publications/Stylus Publishing, London, 56-8 (1996).
- Asika, N. Research Methodology in the Behavioural Sciences. Lagos: Longman Nigeria Ltd, 29 (1991).
- Barrell, R.A.E. and M.G.M. Rowland. Infant foods as a potential source of diarrhoeal illness in rural West Africa. *Trans R Soc Trop Med Hygiene* ; 73:85-90 (1989).
- Benneh, G. Environmental problems and the urban household in the Greater Accra Metropolitan Area (GAMA), Ghana. Stockholm, Environment Institute : 54–60 (1993).
- Black, R.E. Brown, K.H., Becker, S. Abdul, A. M.H. Merson. Contamination of weaning foods and transmission of enterotoxigenic *Escherichia coli* diarrhea in children in rural Bangladesh. *Trans R Soc Trop Med Hygiene* (76) :259-64 (1982).
- Black, R.E. Lopez, de R. G. Brown, K.H. Bravo, N. Bazalar, O.G. and H.C. Kanashiro. Incidence and etiology of infantile diarrhea and major routes of transmission in Huascar, Peru. *Am J Epidemiol* (129):785-99 (1989).
- Burgers, L. Boot, M. V. C. Wijk. Hygiene Education in Water Supply and Sanitation Programmes. IRC, International Water and Sanitation Centre, The Hague, 34-6 (1988).
- Cerrutti, M. Intermittent employment among married women: a comparative study of Buenos Aires and Mexico. *Journal of Comparative Family Studies* 31 (1): 19–45 (2003).
- Curtis, V. Cairncross, S. and R. Yonli. Domestic hygiene and diarrhoea —pinpointing the problem. *Tropical Medicine and International Health* 2000; (5): 22–32 (2003).
- Curtis, V. The dangers of dirt: household hygiene and health Department of Household Studies, Wageningen Agricultural University, 88 (1998).
- Ehiri, J.E. Infant and child mortality in Nigeria: the role of socio-economic factors. Swansea, University of Wales, (1993).
- Ekanem, E.E. Food hygiene behaviour and childhood diarrhoea in Lagos, Nigeria—a case controls studies. *Journal of Diarrhoeal Diseases Research* 9 (3): 219–226 (1991).
- Esrey, S.A. Food contamination and diarrhoea. *World Health* : 19-20 (1990)
- Etiler, N. Velipasaoglu, S. and M. Aktekin. Risk factors for overall and persistent diarrhoea in infancy in

- Antalya Turkey: a cohort study. *Public Health*. (118): 62-9 (2004).
- FSA. Microbiological Food borne Disease Strategy. Revised post Board discussion, <http://www.food.gov.uk/multimedia/pdfs/fdscg-strategyrevised.pdf>. (2001).
- Gorter, A.C. Sandiford, P. Pauw, J. Morales, P. Perez, R.M. and H. Alberts. Hygiene behaviour in rural Nicaragua in relation to diarrhoea. *Int J Epidemiol* (27):90-100 (1998).
- Heller, L. Colosimo, E.A. and C.M.F. Antunes. Setting priorities for environmental sanitation interventions based on epidemiological criteria: a Brazilian study. *J Water Health* (3):271-81(2005).
- Hussain, I. M.S. Anjam. M.B Uddin and M. Hanif. Preparation and Evaluation of Complementary Diets from Germinated Wheat and Lentil for Bangladeshi Children *Pakistan Journal of Science* Vol. 64: 304-308 (2012).
- Hussain, I., I. Shakir and M.Ahamad (2005) Impact of National Support Programme on Development of Rural Areas of Rawalakot A.J&K. *Pakistan Journal of Science* 57: 109-112.
- Jamal, K. Water and environmental sanitation projects- why women? In *Sanitation and Water for All: 24<sup>th</sup> WEDC Conference Islamabad, Pakistan*. 184-187 (1998).
- Ketema, L. and S. Lulseged. Persistent diarrhoea: socio-demographic and clinical profile of 264 children seen at a referral hospital in Addis Ababa. *Ethiopian Medical Journal* 35 (3): 161-168 (1997).
- Khin, M. Wai, N.N. Hman, N.W. Myint, T.T. and T. Butler. Risk factors for the development of persistent diarrhoea and malnutrition in Burmese children. *Int J Epidemiol* (21):1021-1029 (1992).
- Malik, I. A. Iqbal, M. Good, M.J.D. Ashraf, L. Tamizuddin, A.A. Qureshi, A. Ahmed, N. Bukhtari, S. Azim, M. Nawaz, N. Ahmed, and C.M. Anwar. The effect of social conditions on the incidence of diarrhoea in children. *Applied Diarrheal Disease Research Project*. Harvard Institute for International Development : 113-117 (1992).
- Molbak, K. Hojlyng, N. Jepsen, S. and K. Gaarslev. Bacterial contamination of stored water and stored food: a potential source of diarrhoeal disease in West Africa. *Epidemiol Infect* (102):309-16 (1989).
- Motarjemi, Y. Käferstein, F. Moy, G. and F. Quevedo. Contaminated weaning food: a major risk factor for diarrhea and associated malnutrition. *Bull World Health Organ* (71):79-92 (1993).
- Nguyen, T.V. Van, P.L. Huy, C.L. Gia, K.N. and A. Weintraub. Etiology and epidemiology of diarrhea in children in Hanoi, Vietnam. *Int J Infect Diseases* (10):298-308 (2006).
- Oni, G.A. Schumann, D.A. and E. A. Oke . Diarrhoeal disease morbidity, risk factors and treatments in a low socioeconomic area of Ilorin, Kwara State, Nigeria. *J Diarrhoeal Dis Res.* (9):250-57(1991).
- Schmitt, R. Hazards and critical control points of food preparation in homes in which persons had diarrhea in Zambia. *Journal of Food Protection* 60 (2): 161-171 (1997).
- Theodosy J. M. and E.S. Kimaro. Assessment and management of post harvest losses of fresh mango under small-scale business in Morogoro Tanzania. *Journal of Animal & Plant Sciences*, 11: 1358-1363 (2011).
- Togunde, O.R. Determinants of women's employment in urban Nigeria: the impact of socio-economic factors. *Journal of Asian and African Studies*, 34 (3): 279-297 (1999).
- Traore, E. Child defecation behaviour, stool disposal practices and childhood diarrhoea: results from a case-control study. *Journal of Epidemiology and Community Health* (48): 270-275 (1994).
- WHO. World Health Organization. Basic principles for the preparation of safe food for infants and young children. Geneva: World Health Organization, 1 WHO/FNU/FOS/96.6. (1996).
- Yates, F. *Sampling Methods for Census and Surveys*. New York, Charles: Griffin Co Ltd, 87. (1971).