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Prevalence of diarrhoea and its associated factors in children under five years of age in Baghdad, Iraq

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ABSTRACT

Introduction: Diarrhoeal disease is one of the principal causes of morbidity and mortality among children in developing countries. Poor nutrition leads to ill health and it contributes to further deterioration in nutritional status. Methodology: A cross-sectional study was conducted in Baghdad, Iraq. The study was conducted in three paediatric hospitals and from paediatric departments in other three general hospitals in Baghdad, Iraq. Sample was drawn conveniently, three paediatric hospitals from Baghdad hospital list. 150 respondents were chosen from these paediatric hospitals and 50 respondents were chosen from the paediatric departments in three general hospitals. Results: males had twice the risk of diarrhoea (OR 1.9, 95% CI 1.1; 3.5). The risk of diarrhoea was 3 times higher among children with mothers who had lower level of education (OR 3.5 95% CI 1.3; 10.1), 5 times higher with unemployed mothers (OR 4.7 95% CI 2.1; 10.4) and 2 times higher with mothers who had poor nutritional knowledge (OR 2.5 95% CI 1.4; 4.9). The risk of diarrhoea was three times higher among children with fathers who had lower level of education (OR 3.3 95% CI 1.7; 6.6). The binomial logistics regression, Mothers' level of education and employment status, fathers' level of education, mothers' nutritional knowledge were used as possible independent associated factors. Conclusion: Children in Baghdad remain at risk of frequent diarrhoea episodes and other complications which might affect their development status. It is becoming increasingly important to focus on improving the underlying factors by increasing the mother nutritional knowledge through special antenatal classes, and improving family economic status.

KEYWORDS

Diarrhoea; Children; Iraq

1. INTRODUCTION

Iraq is a developing country that has seen the horrors of wars and sanctions for over two decades. As in all wars, the most susceptible group is children, especially on their health. Because of the lack of proper nutrition, sanitation and immunization, there is a serious widespread of diarrhoea. Diarrhoea can be clinically divided into acute watery diarrhoea which lasts several hours or days, acute bloody diarrhoea, and persistent diarrhoea which lasts 14 days or longer. Severe diarrhoea leads to fluid loss, and may be life-threatening, particularly in young children who are malnourished or have impaired immunity. Diarrhoeal disease is one of the principal causes of morbidity and mortality among children in developing countries [1]. It is the second leading cause of death in children under five years old and is responsible for killing 1.5 million children every year.

Diarrhoea often leads to stunting in children due to its association with poor nutrient absorption and appetite loss. The risk of stunting in young children has been shown to increase signficantly with each episode of d iarrhoea [2]. Diarrhoea control, particularly in the first six months of life, can help reduce the prevalence of stunting among children [3].

According to Yip [4], diarrhoea affects children youn-

ger than two years of age disproportionately and can occur rapidly with consequent high mortality rates. Thus, although children younger than 5 years have traditionally been viewed as a sentinel group for nutrition and mortality assessment during crisis, children younger than 2 years should receive special attention because of their high vulnerability to mortality and morbidity. The basic public health oriented programs which include adequate food and basic medical care may not be sufficient to prevent high morbidity and mortality if proper sanitation, safe water, and a diarrheal control programs are lacking. This is acknowledged by the World Health Organization [5] that children who have diarrhoea do not benefit fully from food alone because frequent stools prevent adequate absorption of nutrients.

Diarrhoea which is a significant cause of death among children under 5 years of age due to dehydration which as a result of a fatal loss of water and salt from their bodies (WHO and UNICF) [6] is a major concern in war-ravaged Iraq. According to Siziya *et al*. [7], the gulf war and sanctions due to the lack spare parts, equipment, treatment chemicals, proper maintenance and adequately qualified staff because of the gulf war and sanctions, water from the water treatment plants in Iraq were pumping untreated water. In addition, the water distribution network which most of the population relied on had been destroyed, blocked or were badly leaking resulting in inconsistent water supply, and the families had to store their water. Even stored water becomes contaminated with diarrhoea-causing pathogens. In addition to water supply and contamination [8], maternal factors such as maternal level of education, nutritional knowledge and its economic status were crucial [9,10].

The objectives of the study were to determine the prevalence of diarrhoea and the factors associated with it in children less than five years old in Baghdad, Iraq.

2. METHODS

This is a cross-sectional study was conducted in June 2010.

The study was conducted in three paediatric hospitals and from paediatric departments in other three general hospitals in Baghdad, Iraq.

There are there paediatric hospitals in Baghdad which zere chosen for the study and a list of general hospitals were taken and three of them selected for the study by convenient sampling.

150 respondents chosen from theses paediatric hospitals and 50 respondents from the from paediatric departments in three general hospital. Sample size was calculated by using the Epi info software. The eligibility criteria was children below five years of old and the exclusion criteria was children more than five years old.

A self-administered questionnaire in Arabic language was distributed to the parents of the children. Later Diarrhoea was defined as the passage of 3 or more loose stool per day, or less than 200 g per day. The parents were questioned concerning presence of diarrhoea as confirmed by a physician past two weeks prior to the study. Besides the baseline socio-demographic information the nutritional knowledge of the mother concerning food ingredients and its nutritious content that is important to their children.

Data was be tabulated, cross tabulated and analysed using SPSS version 16. Inferential analysis was done using chi square test. Regression analysis was attempted to determine the associated risk factors. A probability value of $p < 0.05$ was considered to be statistically significant.

For ethical issues the study had received an ethical clearance from the University Kebangsaan Malaysia (UKM) Ethical Committee. All respondents were asked to give an informed written consent before starting the interview. The anonymity of the respondents is assured.

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3. RESULTS

Out of the total of 200 eligible participants responded to the study. The Prevalence of diarrhoea in this study was 63.5%, (n = 128) the median age of children was 8.5 months. As shown in **Table 1**, most of the children were male (57.5%). Most of the mothers of the children were uneducated (91.5%), not employed (83.5%), and however most had good nutritional knowledge (55.0%). Most of the children's fathers were educated (64.5%) and employed (97.0%). Most of the parents' houses were supplied with treated water (80.0%).

As shown in **Table 2**, There was about a two odds increase in the risk of having diarrhoea when the child is a male (OR 1.9 95% CI 1.1; 3.5) and the mothers nutritional knowledge is poor (OR 2.5 95% CI 1.4; 4.9). The risk of diarrhoea is higher in children with mothers who have a lower level of education (OR 3.5 95% CI 1.3; 10.1) and who were unemployed (OR 4.7 95% CI 2.1; 10.4). The risk of diarrhoea is higher among children with fathers who have a lower level of education (OR 3.3 95% CI 1.7; 6.6).

Table 3 shows the results of the binomial logistics regression. Mothers level of education and employment status, fathers level of education, mothers nutritional knowledge were used as possible independent associated factors. The model has an accuracy of 69.5%, −2 log likelihood 234.32, Cox & Snell R square 0.12 and Nagel-kerke R square 0.17. By hierarchy children with mothers are unemployed OR 2.95, 95% CI 1.24 - 7.05, poor nutritional knowledge OR 1.96, 95% CI 1.02 - 3.75,

Table 1. Socio-demographic characteristic of the respondents.

variables	frequency	percent %
Gender		
Male	115	57.5%
Female	85	42.5%
Water supply		
Piped water	40	20%
Sterilized	160	80%
Mother's level of education		
Uneducated	183	91.5 %
Educated	17	8.5 %
Mother's nutritional knowledge		
Poor	90	45%
Good	110	55%
Mother's employment status		
Not employed	167	83.5%
Employed	33	16.5%
Father's employment status		
Employed	194	97.0%
Not employed	6	3.0%
Father's level of education		
Uneducated	71	35.5%
Educated	129	64.5%

fathers OR 2.22, 95% CI 1.08 - 4.61 and mothers OR 3.66, 95% CI 1.79 - 7.23 with low levels of education are significant associated factors.

4. DISCUSSION

Diarrhoeal diseases rank with acute respiratory infections as among the major causes of morbidity and mortality among children under 5 years of age. Generally male children are more active and it's culturally acceptable for them to play outside the homes whereas female children are less likely to play outside and are also more likely to eat home cooked food [10]. Although the differences in the gender was not statistically significant in this study but study conducted in Uganda by Olwedo *et al*. (2008) found male children are at higher risk than female child to get diarrhoea. Similarly [7,11] showed the significance of water type to the risk of diarrhoea. The study sample was collected from around Baghdad city and respondents were mostly from urban and semi urban districts where the qualities of water supply are better than elsewhere. Mothers are generally the decision makers concerning the nutritional and food consumption of children and the family as a whole. Methods of food handling, storage preparation, and personal hygiene all contribute to potential risk factors of having diarrhoea. Mahalanabis *et al*. [12] studied the effect of maternal education and family income on diarrhoea, they found

Table 2. Cross-tabulation between diarrhoea and other variables.

variable	diarrhoea present	diarrhoea absent	p value	POR (95% CI)
Gender				
Male	81 (70.4%)	34 (29.6%)	(0.027)*	1.92 (1.07 - 3.46)
Female	47 (55.3%)	38 (44.7%)		
Water supply				
Piped	27 (67.5%)	13 (32.5%)	(0.606)	1.61 (0.81 - 3.24)
Sterilized	59 (36.9%)	101 (63.1%)		
Nutritional knowledge				
Poor knowledge	67 (75.3%)	22 (24.7%)	(0.003)*	2.49 (1.35 - 4.95)
Good knowledge	61 (55%)	50 (45%)		
Father education				
Uneducated	57 (80.3%)	14(19.7%)	(0.001)*	3.32 (1.68 - 6.56)
Educated	58 (45%)	71 (55%)		
Mother employment				
Not employed	117 (70.1%)	50 (29.9%)	(0.001)*	4.68 (2.11 - 10.37)
Employed	11 (33.3%)	22 (66.7%)		
Mother education				
Uneducated	121 (66.1%)	62 (33.8%)	(0.01)*	3.5 (1.26 - 10.13)
Educated	6 (35.2%)	11 (64.7%)		

*p value < 0.05, Chi square test was used.

Table 3. Logistic regression.

variable	B	S.E	WALD	p value	95% CI for EXP (B)
Father educ. (lower)	0.80	0.37	4.66	0.031	2.22 (1.08 - 4.61)
Higher (reference)					
Mother educ. (lower)	1.29	0.69	3.45	0.06	3.66 (1.79 - 7.23)
Higher (reference)					
Nutritional knowledge (lower)	0.76	0.33	4.18	0.04	1.96 (1.02 - 3.75)
Higher (reference)					
Gender (male)	0.14	0.34	0.17	0.67	1.15 (0.59 - 2.23)
Female (reference)					
Working mother (not working)	1.08	0.44	5.99	0.014	2.95 (1.24 - 7.05)
Working (reference)					

that 7 years of maternal education was associated with more than 50% of reduced the risk of diarrhoea, and high family income was associated with more than 40% of risk reduction.

Parents with low levels of education are more likely to have poor nutritional knowledge. It's found that maternal nutritional knowledge is crucial for decreasing the illness. Low educational levels results in lower choices of the already limited jobs which are culturally acceptable [13]. This would result in decreased contribution to the household income to an already financially challenged household. Same finding was found with El-Gillany and Hammad [14] on their study of prevalence of diarrhoea in children, their study revealed that diarrhoea was lower in children whom parents have higher level of education and both were employed.

5. LIMITATIONS

There are numerous limitations in this study. The most important limitation is the constraint of time; also the sample size was small. Unstable security situation in Baghdad added more difficulties to data collection, and recall bias by respondent's parents.

6. CONCLUSION

Children in Baghdad remain at risk of frequent diarrhoea episodes and other complications which might affect their development status. It's becoming increasingly important to focus on improving the underlying factors by increasing the mother nutritional knowledge through special antenatal classes, and improving family economic status.

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