Revista de Enfermagem e Atenção à Saúde
REAS
ORIGINAL ARTICLE
DOI: 10.18554/reas.v8i1.3139

INFLUENCE OF SOCIOECONOMIC AND HEALTH CONDITIONS IN CHILDREN IN THE OCCURRENCE OF INFANTILE DIARRHEA

INFLUÊNCIA DE CONDIÇÕES SOCIOECONÔMICAS E DE SAÚDE EM CRIANÇAS NA OCORRÊNCIA DE DIARREIA INFANTIL

INFLUENCIA DE CONDICIONES SOCIOECONÓMICAS Y DE SALUD EN NIÑOS EN LA OCURRENCIA DE DIARREIA INFANTIL

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ABSTRACT

Objective: To verify the association between infantile diarrhea with socioeconomic characteristics and health conditions of these children. **Methods:** A cross-sectional study was performed with 448 mothers of children under five years of age, whose children were enrolled in six Primary Health Care Units in the interior of Ceará. Data were analyzed by means of linear and chi-square tests. **Results:** There was a statistically significant association between infant diarrhea and the following variables: lower per capita income (p=0.001); lower child age (p=0.001); not having soap near the taps of the house (p=0.018); not to perform water treatment (p=0.012); water source (p=0.010); not keeping water storage containers covered (p=0.019); toilet without flush (p=0.046); and the child had a history of hospitalization in the first month of life (p = 0.049). Conclusion: It was verified That the income and some variables That Referring to hygienic-sanitary conditions and health conditions of the child are associated with the occurrence of infantile diarrhea.

Descriptors: Diarrhea, Infantile; Child Health; Nursing.

RESUMO

Objetivo: Verificar a associação entre diarreia infantil com características socioeconômicas e condições de saúde dessas crianças. **Método:** Estudo transversal realizado com 448 mães de crianças menores de cinco anos, cujos filhos encontravam-se cadastrados em seis Unidades de Atenção Primária à Saúde do interior do Ceará. Os dados foram analisados por meio dos testes *linear by linear* e quiquadrado. **Resultados:** Verificou-se associação estatisticamente significante entre diarreia infantil e as seguintes variáveis: menor renda *per capita* (p=0,001); idade da criança maior que 36 meses (p=0,001); inexistência de sabão próximo às torneiras da casa (p=0,018); não realizar tratamento da água (p=0,012); origem da água (p=0,010); não

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manter cobertos os recipientes de armazenamento da água (p=0,019); possuir sanitário sem descarga (p=0,046); e criança ter histórico de internação no primeiro mês de vida (p=0,049). **Conclusão:** Constatou-se que a renda e que algumas variáveis referentes à condições higiênico-sanitárias e condições de saúde da criança estiveram associadas à ocorrência de diarreia infantil.
Descritores: Diarreia infantil; Saúde da criança; Enfermagem.

RESUMEN
Objetivo: Verificar la asociación entre diarrea infantil con características socioeconómicas y condiciones de salud de esos niños. **Método:** Estudio transversal realizado con 448 madres de niños menores de cinco años, cuyos hijos se encontraban catastrados en seis Unidades de Atención Primaria a la Salud del interior de Ceará. Los datos fueron analizados por medio de las pruebas lineales lineal y cuadrado. **Resultados:** Se verificó asociación estadísticamente significante entre diarrea infantil y las siguientes variables: menor ingreso per cápita (p = 0,001); menor edad del niño (p = 0,001); no tener jabón cerca de los grifos de la casa (p = 0,018); no realizar tratamiento del agua (p = 0,012); origen del agua (p = 0,010); no mantener cubiertos los recipientes de almacenamiento del agua (p = 0,019); salud no tiene ninguna liberación (p = 0,046); no realizar lactancia exclusiva hasta los seis meses (p = 0,005) y el niño tiene antecedentes de internación en el primer mes de vida (p = 0,049). **Conclusión:** Se constató que la renta y que algunas variables referentes a condiciones higiénico-sanitarias y condiciones de salud del niño están asociadas a la ocurrencia de diarrea infantil.
Descriptores: Diarrea Infantil; Salud del Niño; Enfermería.

INTRODUCTION

Over the past 25 years, infant mortality worldwide dropped by more than half, from 12.7 million in 1990 to 5.9 million in 2015. However, at about 16 thousand children still die per day, being diarrhea, pneumonia, prematurity, malaria and complications in childbirth the major causes of death.[1]

Brazil reduced by 73% its infant mortality rate.[1] The reduction was also achieved in regional spheres; however, there are still considerable disparities, since children living in the north and northeast are at increased risk of dying from diarrhea, compared with children living in other regions.[2]

Moreover, it is noteworthy that the majority of child deaths could be prevented, since diarrhea is a sensitive injury to primary care, being able to be prevented whether certain behaviors are taken, such as: basic hygiene measures, expansion of immunization network, access to basic sanitation, public treatment of water intended for human consumption and promotion of exclusive breastfeeding the child up to six months of age.[3]

However, even though being aware of the cause and effect relationship

between these factors and diarrhea, it is clear that this complaint is still present. Thus, an investigation of the context is needed in which diarrhea is presented, in order to clarify the reasons that still lead to the occurrence of this condition, since it has already been mentioned prevention methods in the literature.

Moreover, the risk factors associated with acute diarrheal disease can be explained within a multi-causal model, including socio-economic, political, demographic, sanitary, environmental and cultural aspects. Thus, in developing countries such as Brazil, the incidence of this disease is directly related to the inefficiency of basic sanitation services and poor demographic conditions, in which the child population is inserted.[4]

Therefore, it is urgent to investigate the associations among the profile of sociodemographic, sanitary and health conditions of children with the occurrence of infantile diarrhea, given that health care should focus, above all, prevention of diseases and disorders, as well as health promotion.

Thus, in assessing the factors associated with diarrhea the nurse can direct his/her care, interventions, guidelines and develop health education strategies, with specific guidelines for families who are more exposed to risk factors.

Therefore, the objective of this study was to investigate the association between the occurrence of infantile diarrhea with socioeconomic characteristics and health status of these children.

METHODOLOGY

It is a cross-sectional, quantitative study, conducted with mothers of children under five years old, whose children found themselves registered in one of the six Primary Health Care Units (UAP), from the interior of Ceará, selected for the study. One chose to include mothers of children under five years, since infantile diarrhea is most prevalent in this age group.

From the formula for calculating finite populations, there was obtained an ideal sample of 448 mothers. Data collection occurred in the very UAPs, from November 2009 to February 2010, through interviews, using a semi-structured form that addressed socio-demographic, sanitary and child health issues.

The inclusion criteria adopted were: mothers with at least one child under the age of five years; and mothers whose children were followed up in the UAPs

selected for the study. The exclusion criterion was mothers with mental disorders that prevented the reliability of the responses. It is emphasized that, in the tables, there was the change in the number of respondents participating in each variable, as some questions were not answered by the entire sample, since some questions were only asked in case the participant answered affirmatively the previous question.

Data were organized and analyzed using IBM SPSS software (version 20). For the comparative analysis, the linear-by-linear and chi-square tests were used, establishing a significance level lower than 0.05.

The study was approved by the Ethics Committee of the Federal University of Ceará, under protocol No. 92/09, and compliance with all standards related to research involving human subjects.

RESULTS

According to Table 1, there was a statistically significant association between the previous episode of infant diarrhea and the following variables: per capita income less than a minimum wage (p=0.001) and child age over 36 months (p=0.001) .

Table 1- Association between family socioeconomic conditions and the occurrence of previous episodes of infantile diarrhea. Fortaleza, Ceará.

Variables	Previous episode of diarrhea		*p*
	Yes	No	
	N -%	N -%	
Mother's group age (n=446)			
≤18 years	21- 63.6	12 - 36.4	
19-29 years	134 - 55.8	106-44.2	0.623[a]
30-39 years	82 - 60.3	54 - 39.7	
≥ 40 years	23 - 62.2	14 - 37.8	
Mother's Marital Status (n=444)			
Companion	216 - 58.1	156 - 41.9	0.631[b]
No companion	44 - 61.1	28 - 38.9	
Mother's Education (n=425)			
<7 years	61 - 63.5	35 - 36.5	0.102[a]
7 - 10 years	106-60.2	70 - 39.8	
> 10 years	92 - 53.8	79 - 46.2	
Number of people in the house (n=447)			
≤4	163-58.2	117 - 41.8	0.995[a]
5-6	66 - 59.5	45 - 40.5	
≥7	32 - 57.1	24 - 42.9	

Per capita income (MW) * (n=413)			
0 - ¼ MW	40-69	18-31	
¼ - ½ MW	83-61	53-39	**0.001**[a]
½ - 1 MW	93 - 62.4	56 - 37.6	
≥ 1	26 - 37.1	44 - 62.9	
Number of children (N=441)			
≥3	231-56.5	164 - 43.5	0.799[b]
≤4	26 - 58.3	20 - 41.7	
Child's Gender (N=447)			
Male	133-59.9	89 - 40.1	0,517[b]
Female	128 - 56.9	97 - 43.1	
Child's age (N=447)			
0 - 6 months	18 - 20.7	68 - 78.2	<**0.001**[a]
7-12 months	29 - 53.7	25 - 46.3	
13-36 months	94 - 65.3	50 - 34.7	
> 36 months	120 - 73.6	43 - 26.4	

*MW: Minimum wage. The value of the MW during the study was R$510.00.

a - linear by linear

b - chi square

When analyzing the housing conditions of the families interviewed, one tried to take into account which aspects found in the house could be risk factors for the occurrence of infantile diarrhea. Thus, as shown in Table 2, statistically significant associations between the occurrence of infantile diarrhea and lack of soap near the taps of the house (p=0.018) were identified; conducting household treatment in the water the child consume (p=0.012); the fact that the child drinking water from sources other than the mineral, such as tank water, lake, rain, among others (p=0.010); coverage of the water storage vessels (p=0.019) and toilet of the house with no flush (p=0.046).

Table 2 - Association among housing conditions and family habits with the occurrence of previous episodes of infantile diarrhea. Fortaleza, 2010.

Variables	Previous episode of diarrhea		p
	Yes	No	
	N -%	N -%	
Soap next to the taps for washing hands (n=428)			
Yes	230 - 58.5	163-41.5	**0,018**[a]
No	25 - 71.4	10 - 28.6	
Household water treatment that the child consumes (n=432)			
Yes	86 - 67.2	42 - 32.8	**0,012**[a]
No	170 - 55.9	134 - 44.1	
Residence garbage disposal (n=447)			

Public collection	247- 57.7	181 - 42.3	0,167[b]
Left in the open /river	14 - 73.7	5 - 26.3	
Origin of the water consumed by the child (n=441)			
Mineral	165 - 54.8	136 - 45.2	**0.010**[b]
Others	95 - 67.9	45 - 32.1	
Coverage of the water consumed containers (n=413)			
Covered	182 - 61.9	112 - 38.1	**0.019**[a]
Discovered	33 - 52.4	30 - 47.6	
Not applicable	24 - 42.9	32 - 57.1	
Toilet Type (n=444)			
Flushed with water	190-55.6	152 - 44.4	**0.046**[b]
No flushed water	68 - 66.7	34 - 33.3	

a - linear linear by

b - chi square

It can be observed in the sample studied, as in Table 3, that there was a significant relationship between the previous occurrence of diarrhea and the following variables: the existence of diseases in children at the moment of the interview (p<0.001) and hospitalization of the child in the first month life (p=0.049).

Table 3 - Association between the child's health conditions and the occurrence of previous episodes of infantile diarrhea. Fortaleza, Ceará.

Variables	Previous episode of diarrhea		p
	Yes	No	
	N -%	N -%	
Birth weight (n=410)			
Low weight (> 2500g)	22 - 50.0	22 - 50.0	0,420[a]
Insufficient (2500 - 2999g)	30 - 54.5	25 - 45.5	
Suitable (3000 - 3999g)	161-61.2	102 - 38.8	
Overweight (< 4000g)	26 - 54.2	22 - 45.8	
Existence of current diseases in child (n=447)			
Yes			
No	62 - 76.5	19 - 23.5	**<0.001**[b]
	199-54.4	167 - 45.6	
Bottle feeding to infant feeding (n=447)			
Yes			
No	138 - 59.2	95 - 40.8	0,708[b]
	123-57.5	91 - 42.5	
Child's hospitalization in the first month of life n=447)			
Yes	52 - 68.4	24 - 31.6	**0.049**[b]
No	209-56.3	162 - 43.7	

a - linear by linear

b - chi square

DISCUSSION

Despite the study findings have not shown any association between infantile diarrhea and certain sociodemographic variables, one recognizes the possibility of the maternal age group to influence the occurrence of this disease, because it is believed that younger mothers have little experience to identify the signs and symptoms of diseases and children's diseases, as well as may have still insufficient skills to promote essential care to children.[5] Also noteworthy is the influence of maternal education in the care of the children, for being a marker of the socioeconomic condition of the mother and her family, relating in this context with the cultural and behavioral profile.[3]

Regarding the per capita income, authors showed that this social determinant is directly related to the development of enteroparositosis and infantile diarrhea[2], as well as it interferes with maternal self-efficacy to prevent this disorder.[6] These findings corroborate the results of this study.

Apart from this fact, it is believed that insufficient income can favor the occurrence of precarious social conditions and lower parental level of information on preventive measures of diarrhea, which directly affects the ability to ensure good nutrition for children and, consequently, prevent and treat diarrhea.[7]

In some places, the lack of understanding of what is actually diarrhea and that it is a serious disease can prevent a more significant advance in combating it. This was demonstrated by a study conducted in Africa, which found the efficiency of a media campaign informing about the forms of contamination, recognition and perception of diarrhea severity, besides encouraging the use of Oral Rehydration Solution (ORS) as a way to combat dehydration, major complication of infantile diarrhea. It should be noted that the use of ORS among caregivers increased by 10% after the campaign.[8] Thus, it is evident the importance of investing in health education in order to guide the public on this subject, which may contribute to reduce infant diarrhea rates.

The age of the child also emerged as an important predictor in the development of infantile diarrhea. However, in this study the diarrheal episodes occurred more frequently in children older than 36 months, which is opposed to researches carried out in Mozambique, which demonstrated that this disease is most frequent in children under one year old.[9]

Another factor that demonstrated significant association with the occurrence of diarrhea was the absence of soap near the taps (71.4%). The relevance of having this hygiene product has also been highlighted by a research carried out in Kenya. It concluded that diarrhea prevalence in children up to five years old fell 41% in households that had soap to hand hygiene, when compared with households that did not have this cleaning product.[10] The existence of soap near the house taps provides greater convenience in washing hands habit; furthermore, it is known that investing in improving hygiene, mainly in preschool age is an effective intervention, as it allows better control of infectious diseases.[11]

However, still regarding this variable, it was noticeable that the association between having soap near the faucets and the development of infantile diarrhea was also considerable. This result may be associated with hand hygiene inappropriately by the caregivers and the child. Another factor that may have influenced this result refers to the occurrence of previous diarrheal episodes, which may have favored the use of this cleaner, in order to reduce new cases of this disease.

Moreover, children are more likely to be affected by diseases spread through water and food, due to the immaturity of the digestive system and the inefficient immunological barrier.[9] Therefore, it is essential adequate treatment of water for human consumption, since this can serve microorganisms and promote the development of these in human beings.[12]

However, this study noted a significant association between water treatment (filtration, boiling, strain through a cloth) at home and the occurrence of infantile diarrhea. This finding may not be directly associated with the act of performing the water treatment, but in the place where it is stored, which may contain microorganisms and waste that may be contaminating it and, thus, favoring the development of this condition.

It is emphasized that the correct storage of water, as well as adequate coverage of the containers prevent its exposure to insect vectors and dust, which could pollute the liquid of continuous consumption.[13] It was realized that, in this study, diarrhea was statistically associated with the container cover where water was stored. This result may be related to the ineffective coverage, which may have

allowed the contamination of water and caused diarrhea in children.

Taking into account the housing characteristics of the families that were part of the research, having a flushed toilet proved to be influential in preventing the illness of the children. Confirming this finding, a study in Macapá showed significant association between development of infantile diarrhea and the absence of the toilet at home.[14]

The concern with the improvement of basic sanitation exists in virtually all countries, especially those that are still under development, since unfavorable sanitary conditions are directly related to the development of infantile diarrhea.[15]

The number of hospitalizations of children under five years can be used as a parameter for the development of strategies in the public health sector, disease prevention and health education of families, given that there are several risk factors for that hospitalizations occur in young children.

In this research, although the use of bottle for infant feeding has not been related to the occurrence of diarrhea, it is known the influence of this practice in the early weaning, as well as in the contamination of children, often due to poor hygiene of this resource and improper maintenance of appliances. It also affects the development of oral muscles of the child, making sucking and chewing dificult.[16,17]

In addition, there is the fact that, whether interventions and care packages proven effective were implemented, 54% of cases of diarrhea in 2025 would be reduced at a cost of $ 3.8 billion, less than is spent on hospitalizations and treatments for this disease. Thus, several interventions could reduce morbidity and overall burden of diarrhea, with possible benefits for child and countries development.[4]

CONCLUSION

It is noticed that numerous factors can be decisive in the involvement of a gastrointestinal disease or from other origin that can cause diarrhea in children. More precisely, as identified in this study, low family income, child older than 36 months, the care with the water source the child drinks, the inadequate disposal of household waste, admissions during the first month of life and involvement of diseases, currently, have been explicitly related to episodes of diarrhea at some point in life. Knowing these factors, one can act in a more targeted manner in the

pursuit of preventing such harm to children's health.

It is for the nursing staff to act on this issue, as well as the other health professionals; besides the competent authorities with regard to the works of basic sanitation and water treatment, with actions to ensure the safety to health of the population that use the public service. The nurse, mainly responsible for the activities of Health Education and a professional with important role in Primary Care, need to be closer to the epidemiological data of the population. With this in mind, he is able to understand in which aspects he must intensify preventive actions. Furthermore, he needs to seek to minimize the risk factors for infantile diarrhea.

Finally, it is highlighted as limiting factors the fact that this was a single-center study, which has used convenience sampling. Thus, it is highlighted the need for further studies to promote more detailed follow-up on this subject.

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RECEIVED: 29/08/18
APPROVED: 08/05/19
PUBLISHED: 07/2019