

## SOCIAL CONDITIONS AND MATERNAL CONDUCTS IN THE PREVENTION AND MANAGEMENT OF INFANTILE DIARRHEA

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**ABSTRACT:** The aim was to characterize the social conditions, incidence of diarrhea, and maternal conducts in the prevention and management of this pathology. A descriptive study was undertaken with 385 mothers of children below five years of age, resident in the rural region of Ceará, in August – October 2015. Structured interviews were held, and the data were analyzed using descriptive statistics. It was ascertained that 79.7% of the houses had a septic tank; 71.1% used the public service as their water supply; 96.6% of the mothers washed their hands with soap and water; 52.7% of the children investigated had had diarrhea; and 91.2% of the mothers who mentioned offering home-prepared oral rehydration solution to their child prepared this inadequately. It was observed that maternal skills are essential for the children's well-being, and that it is important that the mothers should be provided with guidance and encouraged in relation to the prevention and treatment of diarrhea.

**DESCRIPTORS:** Diarrhea, Infantile; Social Conditions; Maternal Behavior; Nursing; Child Health.

### CONDIÇÕES SOCIAIS E CONDUTAS MATERNAS NA PREVENÇÃO E MANEJO DA DIARREIA INFANTIL

**RESUMO:** Objetivou-se caracterizar as condições sociais, incidência de diarreia e as condutas maternas na prevenção e manejo dessa patologia. Estudo descritivo realizado com 385 mães de crianças menores de cinco anos residentes no interior do Ceará no período de agosto a outubro de 2015. Foram realizadas entrevistas estruturadas e os dados foram analisados por estatística descritiva. Verificou-se que 79,7% das casas possuíam fossa séptica; 71,1% utilizava o serviço público como abastecimento de água; 96,6% das mães lavavam as mãos com água e sabão; 52,7% das crianças investigadas tiveram diarreia; e 91,2% das mães que referiram oferecer soro caseiro ao filho realizavam o preparo inadequadamente. Constatou-se que habilidades maternas são essenciais para o bem-estar das crianças, sendo importante que elas sejam instruídas e encorajadas quanto à prevenção e tratamento da diarreia.

**DESCRIPTORIOS:** Diarreia infantil; Condições sociais; Comportamento materno; Enfermagem; Saúde da criança.

### CONDICIONES SOCIALES Y CONDUCTAS MATERNAS PARA LA PREVENCIÓN Y MANEJO DE LA DIARREA INFANTIL

**RESUMEN:** El objetivo del estudio fue caracterizar las condiciones sociales, la incidencia de diarrea y las conductas maternas para la prevención y manejo de esa patología. Estudio descriptivo realizado con 385 madres de niños menores a cinco años, residentes en el interior de Ceará, de agosto a octubre de 2015. Fueron realizadas entrevistas estructuradas, datos analizados mediante estadística descriptiva. Se verificó que 79,9% de las casas poseía pozo séptico; 71,1% utilizaba el servicio público como fuente de abastecimiento de agua; 96,6% de las madres lavaba sus manos con agua y jabón; 52,7% de los niños investigados sufrieron diarrea; y 91,2% de las madres que informaron ofrecer suero casero al hijo realizaban la preparación de modo incorrecto. Se constató que las habilidades maternas son esenciales para el bienestar de los niños, siendo importante que las mismas hayan recibido instrucción y aliento para la prevención y tratamiento de la diarrea.

**DESCRIPTORIOS:** Diarrea Infantil; Condiciones Sociales; Conducta Materna; Enfermería; Salud del Niño.

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## ● INTRODUCTION

Diarrhea, dysentery and gastroenterites, commonly known as acute diarrheal diseases, are a public health problem, as they are responsible for higher rates of morbidity and mortality in children below the age of five<sup>(1)</sup>.

Diarrhea is a public health problem worldwide – above all in developing countries<sup>(2)</sup>. The rate of child mortality in Brazil, however, has decreased over recent decades, this fact being related to certain stances adopted; such as the increase in vaccine coverage and prenatal care, the use of oral rehydration therapy, and encouragement to exclusive breastfeeding up to the age of six months, adopted by the Brazilian government in order to improve this population's quality of life and life expectancy<sup>(3)</sup>.

In Brazil, between 1998 and 2015, it may be noted that the rates of diarrhea among children below two years old have reduced considerably, as 1,346,506 and 511,893 cases were recorded, respectively<sup>(4)</sup>. In spite of this decrease, diarrhea continues to be one of the main causes of morbidity and mortality in children below five years old, including in Brazil<sup>(5)</sup>.

This condition is frequently recurrent among the infectious diseases caused by bacteria, viruses and parasites. Besides this, it may be associated with biological, environmental, behavioral, economic and sociocultural variables<sup>(6)</sup>.

Because of this, it is necessary to investigate variables which may influence the occurrence of diarrhea in children, such as family income, age, the mother's educational level, the water supply, basic sanitation, and the type of sewage system and garbage collection in place, among others. These social conditions can interfere in the family's access to materials for bodily hygiene and for cleaning their environment, as well as to medications and health-related information; they can result in the ingestion of contaminated food and water and in the accumulation of different vectors for parasitic and infectious diseases in the environment.

Knowledge of these social aspects is essential if interventions capable of minimizing them are to be implemented, with a view to promoting the population's health. Among the strategies, emphasis is placed on some which can be undertaken by the mothers who are these children's main caregivers<sup>(7)</sup>, namely: promotion of breast-feeding, washing of hands and utensils, keeping the child up-to-date with vaccinations, and using treated water for drinking and preparing foods, among others.

Furthermore, studies have demonstrated that it is the mothers are the main people responsible for making decisions regarding the conducts which must be undertaken in managing infantile diarrhea<sup>(8)</sup>. Given the influence of the maternal care provided to the children, it is necessary to accept the mothers' primary role in reducing the rates of infantile diarrhea<sup>(9)</sup>.

Thus, the present study's objectives were to characterize the social conditions of families, the incidence of infantile diarrhea and the maternal conducts employed in the prevention and management of this pathology.

## ● METHOD

This is a descriptive, exploratory, cross-sectional study, with a quantitative approach, undertaken with mothers of children below the age of five, who were resident in a city in the rural region of the Brazilian state of Ceará. It was undertaken in eight Primary Healthcare Units in the urban or rural zones of the municipality.

The study was selected by convenience, and the following were used as inclusion criteria: mothers who had at least one child age below five years old who was registered with the Primary Healthcare Units selected in the study. Mothers with restrictions which made it impossible for them to understand the instruments used were excluded.

The formula for finite populations was used for determining the sample of 385 mothers, considering the prevalence of phenomena at 50%, sampling error of 5%, and a constant of  $Z=1.96$ . Data collection

was undertaken in August – October 2015, through interviews held in the Primary Healthcare Units themselves, using an instrument which addressed social-sanitary variables in relation to infantile diarrhea, and the management and prevention of this health problem.

The data were organized and analyzed using the IBM SPSS statistics program (version 20), through the use of descriptive statistics, using absolute and relative data as well as measurements of central tendency and dispersion. The study was approved by the Research Ethics Committee of The University for International Integration of the Afro-Brazilian Lusophony, under Opinion N. 1,164,864.

## ● RESULTS

It was ascertained that 215 (55.8%) of the mothers participating in the study lived in the municipality's urban zone. The ages found in the sample varied from 13 to 49 years old, with a mean of 27.55 (SD=± 7.2), with the most prevalent age range being from 19 to 29 years old (N=218; 56.7%). Regarding the mothers' educational level, 146 (38.1%) had spent between 1 and 4 years in school, the mean length of study being 7.5 years (SD=±4.6). Furthermore, 68.4% of the families included in the study survived on a per capita income of up to R\$197, with a mean of R\$210 (SD± R\$ 216). The mean age of the children was 22 months (SD±16 months).

Based in Table 1, which presents the data obtained regarding the housing and environmental conditions, it can be seen that 299 (79.7%) of the houses have a septic tank; 273 (71.1%) have the public network as their main source of water supply; 370 (96.6%) of the mothers wash their hands with soap and water, mainly during the preparation of foods, as mentioned by 268 (69.6%) of the mothers.

Table 1 – Distribution of the participants in the study, by housing and environmental conditions. Redenção, CE, Brazil, 2015 (continues)

Variables	N	%
Household water supply (N=384)		
Public network	273	71.1
Well/waterhole	79	20.6
Cistern	14	3.6
Lake, river or stream	7	1.8
Fountain	5	1.3
Others	6	1.5
Type of sewage system (N=375)		
Cesspit	299	79.7
Public network	36	9.6
Open defecation	36	9.6
Unknown	4	1.1
Removal of domestic garbage (N=385)		
Public collection	275	71.4
Burnt	103	26.8
Thrown into the immediate environment	7	1.8
Inside toilet (N=385)		
Yes	361	93.8
No	24	6.2
Type of toilet (N=361)		
With flush	247	68.4
Without flush	114	31.6

Presence of a refrigerator in the house (N=385)		
Yes	371	96.4
No	14	3.6
Presence of flies in the house (N=385)		
In the rainy season	236	61.3
Sometimes (irrespective of the time of year)	72	18.7
All year round	41	10.6
Never	36	9.4

Table 2 shows data related to the occurrence and management of infantile diarrhea.

Table 2 – Distribution of study participants by occurrence and management of infantile diarrhea. Redenção, CE, Brazil, 2015 (continues)

Variables	N	%	Mean (Standard deviation)
Previous diarrhea (N=383)			
Yes	202	52.7	
No	181	47.3	
Duration of diarrhea (N=88)			
< 14 days (acute)	88	100	3.5 ( $\pm$ 1.7)
$\geq$ 14 days (persistent)	-	-	
Signs/symptoms associated with the episode of diarrhea (N=197)			
Vomiting	59	29.9	
Fever	77	39.1	
Mucus	59	29.9	
Blood	11	5.6	
Sought help from the health service during the diarrhea (N=197)			
Yes	133	67.5	
No	64	32.5	
Used a home recipe for treating diarrhea (N=198)			
Yes	128	64.6	
No	70	35.4	
Home recipe used (N=128)			
Tea made from the buds from the end of the twigs on guava trees	27	21.4	
Coconut water	21	16.7	
Tea from the leaves of the boldo tree	14	11.1	
Orange peel tea	32	25.4	
Constipating fruit	5	4	
Use of home-made oral rehydration solution (N=382)			
Yes	92	24.1	
No	290	75.9	
Dilution of home-made oral re-hydration solution (ORS) (N=68)			
Correct	6	8.8	
Incorrect	62	91.2	
Use of ORS (N=379)			
Yes	133	35.1	
No	246	64.9	

Dilution of ORS (N=111)		
Correct	96	81.3
Incorrect	15	12.7
Vaccination against rotavirus (N=369)		
Yes	361	97.8
No	8	2.2
Maternal conduct regarding feeding during the diarrhea (N=334)		
Suspending normal feeding	45	13.5
Continues offering the same food	72	21.6
Seeks to improve the food and provide more hydration	217	65

It was observed that 52.7% (N=202) of the children had had a previous episode of diarrhea with a mean duration of 3.5 days (SD= $\pm$ 1.7); the principal symptom presented by the children during the episodes of diarrhea was fever (N=77; 39.1%); however, 67.5% (N=133) of the mothers sought help from one of the health services.

It is emphasized that 173 (86.9%) of the children investigated had not received inpatient treatment for diarrhea, but that 64.3% (N=128) had made use of drugs prescribed by health professionals in order to treat the condition.

During the management and treatment of infantile diarrhea, 64.6% (N=128) of the mothers mentioned using home remedies, the most used being tea made from orange peel (N=32; 25.4%); they used industrialized oral re-hydration solution from a bottle or from a sachet (N=246; 64.9%) and 65% (N=217) mentioned seeking to improve on what their children ate during the occurrence of episodes of diarrhea.

For the mothers who participated in the study, the main causes of diarrhea are: contaminated water (N=315; 90.9%), fatty food (N=337, 87.5%), teething (N=334; 86.8%), contaminated food (N=328; 85.2%), verminosis (N=323; 83.9%), undercooked food (N=315; 81.8%), dirty hands/objects in the mouth (N=315; 81.8%), catching a cold (N=293; 71.1%) and frights or 'the evil eye' (N=268; 69.6%).

Finally, it was ascertained that 65.8% of the mothers studied mentioned not having been previously informed about ways of preventing or treating infantile diarrhea.

## ● DISCUSSION

Although one study undertaken in Vietnam showed the risk of infantile diarrhea to be greater in rural zones than in urban zones<sup>(10)</sup>, during the undertaking of the present study, it was noticed that although the majority of the families live in the urban zone, the number of children who presented previous episodes of diarrhea was greater than those who did not.

It is emphasized that 56.6% of the mothers in the sample studied were aged between 19 and 29 years old. This finding is positive, because it is believed that age is a variable which may negatively affect the care undertaken by the mothers.

Corroborating this assertion, a separate study showed that the lower the age, the fewer the opportunities an individual has to receive information about means of preventing or managing infantile diarrhea<sup>(11)</sup>. In addition to this, this variable may be associated with the misinterpretation of information<sup>(12)</sup>.

Countering this, a study undertaken in two municipalities in the Northeast of Brazil showed that children of mothers aged 30 years old or over, and with a larger number of children, had fewer consultations in the health services<sup>(13)</sup>. As a result, it may be perceived that extremes of age may negatively affect the maternal care, thus increasing the risk for the development of pathologies in childhood.

Low maternal educational level is another determinant which can influence the development of infantile diarrhea, as a study undertaken in the State of Pernambuco demonstrated that children whose mothers had a low educational level had more episodes of diarrhea than did children of mothers with a high educational level<sup>(14)</sup>.

Accordingly, as 37.9% of the participants in this study had studied for between 1 and 4 years, it is believed that the number of children who had had diarrhea may be associated with the mothers' educational level.

It was observed that 68.4% of the families studied lived below the poverty line, surviving on a mean per capita income of R\$ 210 (SD± R\$ 216). This finding is concerning, as another study has shown there to be a directly proportional relation between child mortality from acute diarrheal disease in children younger than five years and families whose per capita income is of up to half a minimum salary<sup>(15)</sup>.

It was observed that 34.3% of the children participating in the study were below one year old, a period in which the risk of having diarrhea is high, as the immune system develops in proportion to the child's age. This result may be related to the number of children who have had the disease, as a study undertaken in Mozambique also evidenced that the number of episodes of diarrhea is higher in children aged below 1 year old<sup>(8)</sup>.

It was noted that 77.7% of the sample lived in houses made of brick with cement, which is configured as a positive factor, as the fact of housing not being made out of brick is a risk factor for the development of diarrhea in children below five years old<sup>(16)</sup>.

Although 93.8% of the families had a toilet in their residence, it was noted that 31.6% of the houses did not have a toilet that flushed. This finding is concerning, as another study has shown that people who do not have a flushing toilet in their homes tend to meet their physiological needs out in the open air, which facilitates contamination by various microorganisms<sup>(17)</sup>.

Besides this, it was noted that there are still families who throw their garbage out in the surroundings of their house and who urinate or defecate outside (open defecation). This result is also a cause for concern, as behaviors such as defecating directly into the soil, discarding garbage close to the home<sup>(17)</sup>, and the inappropriate disposal of disposable diapers<sup>(18)</sup> are factors which increase the risk of the dissemination of infectious diseases, including diarrhea.

It was also noted that the majority of the sample had access to services supplying water and adequate basic sanitation. This finding is positive, as one study undertaken in Latin America ascertained that the rate of diarrhea in children below five years old reduces as the coverage of the population by water and sewerage services rises<sup>(19)</sup>.

It is known that one strategy for preventing infantile diarrhea is for children to drink treated water, but in this study it was ascertained that a large proportion of the mothers do not treat the water drunk by their children. This finding may be directly related to the incidence of diarrhea found in this study, as the rate of intestinal parasitoses is lower among people who filter water before consuming it<sup>(20)</sup>.

It was ascertained that 96.6% of the sample mentioned washing their hands with soap and water, which is an important action in preventing diarrhea, as one study undertaken in the rural zone of Kenya concluded that the rate of prevalence of diarrhea in children below five years old reduced by 41% in residences which had soap for handwashing, when compared with those residences which did not<sup>(21)</sup>.

Corroborating that, one study undertaken in Tanzania showed that children below five years old whose families did not wash their hands adequately were at greater risk of diarrhea in comparison with those living in families who did carry out this practice<sup>(22)</sup>.

It was identified that 52.7% of the children studied had already had episodes of diarrhea, it being verified that 67.5% of the mothers (N=133) sought a health service for these cases. This corroborates a study undertaken in Gambia which demonstrated that 48.4% of children with diarrhea were taken to health units<sup>(23)</sup>.

At variance with these data, one study undertaken in Mali demonstrated that 57% of caregivers sought help from traditional medicine (traditional healers, or people who had empirical knowledge,

involving the use of rituals/herbs, among others) in treating diarrhea, while 27% sought help from professionals working in governmental health centers<sup>(24)</sup>.

The home remedy used most by the interviewees was tea made from orange peel (N=32; 25.4%), differing from a cross-sectional study undertaken in the city of Fortaleza (CE), which showed that home-prepared oral rehydration solution was used most by the mothers (80%) in managing infantile diarrhea<sup>(1)</sup>.

Oral rehydration therapy is an important strategy in preventing loss of water and electrolytes, and is efficacious in 95% of cases of diarrhea which involve dehydration<sup>(25)</sup>. Nevertheless, it was observed that 91.2% of the mothers prepared the oral rehydration solution inadequately, leaving it concentrated, which could worsen the situation of dehydration and cause the child's death.

It was evidenced that 97.8% of the children studied had been vaccinated against rotavirus. This finding is positive, as studies have shown the positive impact this vaccine has had in Brazil<sup>(26)</sup>, being a relevant aspect for preventing diarrhea, bearing in mind that approximately 20% of deaths and 40% of hospitalizations caused by this problem are caused by the rotavirus<sup>(25)</sup>.

It was identified that 65% of the mothers investigated sought to improve how their children were fed and to keep them hydrated during episodes of diarrhea, a conduct recommended by the Brazilian Ministry of Health<sup>(27)</sup>.

On the other hand, a study undertaken in Gambia revealed that 72.5% of the caregivers offered their children less food than usual, a conduct which could increase the risk of complications caused by this condition. However, it may be noted that that study corroborates the results of the present study, in relation to ingestion of water, as 63.9% of the sample studied in Gambia mentioned having offered greater volumes than normal to children during episodes of diarrhea<sup>(23)</sup>.

It was ascertained that 65.8% of the women mentioned not having received information on how to prevent diarrhea in their children. This finding is concerning, as health education is part of the nurse's duties and should be put into practice by nurses on a daily basis.

It is known that the entire health team, and above all the nurse, must be involved in health promotion and prevent diseases through educating the population. This needs to be encouraged through the exchanging of knowledges and experiences between health professionals and service users, avoiding the vertical transmission of information<sup>(28)</sup> and promoting horizontal communication.

Child mortality and diarrheal disease are topics which – due to their importance – are constantly being debated worldwide. This study may be used by professionals who work in the health services as an instrument capable of identifying the main weak points and determinants involved in infantile diarrhea, both guiding and providing support for interventions which aim to reduce rates of morbidity and mortality caused by this health problem.

This study's limitations are that it has a convenience sample and that it was unicentric. Emphasis is placed on the fact that, although the data collection was undertaken with 385 mothers, some variables did not have a complete sample, as the study considered only those mothers who had responded to the items mentioned. As a result, emphasis is placed on the need to undertake further studies in this field, so as to guide the nursing care for children, and contribute to reducing the rates of infantile diarrhea.

## ● CONCLUSION

It was ascertained that, in the families studied, favorable social and sanitary conditions predominated. In spite of this, diarrhea was presented as a pathology which occurs in 52.7% of the children in the sample studied.

It was noted that 91.2% of the mothers prepared the oral rehydration solution inadequately. This result may be directly related to the fact that 65.8% of the sample mentioned not having been told about ways of preventing and treating diarrhea.

Accordingly, it is essential for nurses to receive continuous education so that they may promote interventions and develop instruments and educational strategies aiming to instruct the mothers regarding conducts which they can carry out in order to prevent and treat infantile diarrhea and to avoid complications caused by this, in the pediatric population.

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## ● REFERENCES

1. Joventino ES, Freitas LV, Vieira NFC, Aquino PS, Pinheiro AKB, Ximenes LB. Habilidades maternas para prevenção e manejo da diarreia infantil. *Cienc. enferm.* [Internet] 2013;19(2) [acesso em 22 jan 2016]. Disponível: <http://dx.doi.org/10.4067/S0717-95532013000200007>.
2. Carneiro AMMA, Patriota EF, Oliveira JSA, Gomes MGCGP, de Medeiros SM, Fernandes SMBA. Prevention of infantile diarrhea: integrative literature review. *J Nurs UFPE on line.* [Internet] 2012;6(5) [acesso em 22 jan 2016]. Disponível: <http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/2594>.
3. Castanhel MS, Schaefer-Bittencourt ILC, de Souza ML, Botelh LJ, da Silva JCB. Mortalidad neonatal en el Estado de Santa Catarina, Brasil. *Revista Cubana de Enfermería.* [Internet] 2013;29(3) [acesso em 20 jan 2016]. Disponível: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-03192013000300001](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03192013000300001).
4. Ministério da Saúde (BR). Sistema de Informação da Atenção Básica (SIAB). Situação de saúde. [Internet] 2015 [acesso em 17 fev 2016]. Disponível: <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?siab/cnv/SIABSBR.DEF>.
5. United Nations Children's Fund (UNICEF). Levels and Trends in Child Mortality. [Internet] 2015 [acesso em 22 jan 2016]. Disponível: <https://data.unicef.org/resources/levels-and-trends-in-child-mortality-2015/>.
6. Brandt KG, Antunes MMC, da Silva GA. Acute diarrhea: evidence-based management. *J. Pediatr. (Rio J.)*. [Internet] 2015;91(6 Suppl 1). Disponível: <http://dx.doi.org/10.1016/j.jped.2015.06.002>.
7. Joventino ES, Ximenes LB, Almeida PC, Oriá MOB. The Maternal Self-efficacy Scale for preventing early childhood diarrhea: validity and reliability. *Public Health Nurs.* [Internet] 2013;30(2) [acesso em 23 jan 2016]. Disponível: <http://dx.doi.org/10.1111/j.1525-1446.2012.01042.x>.
8. Nhampossa T, Mandomando I, Acacio S, Nhalungo D, Sacoora C, Nhacolo A, et al. Health care utilization and attitudes survey in cases of moderate-to-severe diarrhea among children ages 0-59 months in the District of Manhica, southern Mozambique. *Am. J. Trop. Med. Hyg.* [Internet] 2013;89(1 Suppl) [acesso em 23 jan 2016]. Disponível: <https://doi.org/10.4269/ajtmh.12-0754>.
9. Lopes TC, Chaves AFL, Joventino ES, Rocha RS, Castelo ARP, Oriá MOB. Avaliação da autoeficácia materna para a prevenção da diarreia infantil. *Rev. Rene.* [Internet] 2013;14(6) [acesso em 24 jan 2016]. Disponível: <http://www.periodicos.ufc.br/index.php/rene/article/view/3720>.
10. Nguyen HT, Eriksson B, Petzold M, Bondjers G, Tran TK, Nguyen LT, et al. Factors associated with physical growth of children during the first two years of life in rural and urban areas of Vietnam. *BMC Pediatr.* [Internet] 2013;13(149) [acesso em 22 jan 2016]. Disponível: <http://dx.doi.org/10.1186/1471-2431-13-149>.
11. Joventino ES, Coutinho RG, Bezerra KC, de Almeida PC, Oriá MOB, Ximenes LB. Self-effectiveness in preventing diarrhea and child care: a transversal study. *Online Braz J Nurs.* [Internet] 2013;12(2) [acesso em 22 jan 2016]. Disponível: <http://www.objnursing.uff.br/index.php/nursing/article/view/3961>.
12. Andrade LCO, dos Santos MS, Aires JS, Joventino ES, Dodt RCM, Ximenes LB. Conhecimento de puérperas internadas em um alojamento conjunto acerca da higiene do neonato. *Cogitare Enferm.* [Internet] 2012;17(1) [acesso em 25 jan 2016]. Disponível: <http://dx.doi.org/10.5380%2Fce.v17i1.26381>.



13. da Costa JSD, Cesar JA, Weber AP, Garcez AS, Nora CRD, Rower HB, et al. Características das crianças menores de cinco anos atendidas em serviços de atenção básica em dois municípios do nordeste brasileiro. *Rev. Bras. Saúde Matern. Infant.* [Internet] 2015;15(1) [acesso em 24 jan 2016]. Disponível: <http://dx.doi.org/10.1590/S1519-38292015000100003>.
14. Melo DS, Oliveira BL, de Andrade MIS, Pinto RH, Barreto Neto AC. Diarreia aguda em crianças menores de dois anos assistidas no Programa de Saúde da Família no município de Vitória de Santo Antão, Pernambuco, Brasil. *Pediatria Moderna.* [Internet] 2012;48(8) [acesso em 24 jan 2016]. Disponível: [http://www.moreirajr.com.br/revistas.asp?fase=r003&id\\_materia=5133](http://www.moreirajr.com.br/revistas.asp?fase=r003&id_materia=5133).
15. Teixeira JC, Gomes MHR, de Souza JA. Análise da associação entre saneamento e saúde nos estados brasileiros – estudo comparativo entre 2001 e 2006. *Eng. Sanit. Ambient.* [Internet] 2011;16(2) [acesso em 24 jan 2016]. Disponível: <http://dx.doi.org/10.1590/S1413-41522011000200014>.
16. da Paz MGA, de Almeida MF, Günther WMR. Diarrhea in children and sanitation and housing conditions in periurban areas in the city of Guarulhos, SP. *Rev. bras. epidemiol.* [Internet] 2012;15(1) [acesso em 24 jan 2016]. Disponível: <http://dx.doi.org/10.1590/S1415-790X2012000100017>.
17. Simões BS, Machado-Coelho GLL, Pena JL, de Freitas SN. Condições ambientais e prevalência de infecção parasitária em indígenas Xukuru-Kariri, Caldas, Brasil. *Rev Panam Salud Publica.* [Internet] 2015;38(1) [acesso em 24 jan 2016]. Disponível: [http://www.scielosp.org/scielo.php?script=sci\\_arttext&pid=S1020-49892015000600006](http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1020-49892015000600006).
18. da Silva CV, Heller L, Carneiro M. Cisternas para armazenamento de água de chuva e efeito na diarreia infantil: um estudo na área rural do semiárido de Minas Gerais. *Eng. Sanit. Ambient.* [Internet] 2012;17(4) [acesso em 24 jan 2016]. Disponível: <http://dx.doi.org/10.1590/S1413-41522012000400006>.
19. Bühler HF, Ignotti E, Neves SMAS, Hacon SS. Análise espacial de indicadores integrados determinantes da mortalidade por diarreia aguda em crianças menores de 1 ano em regiões geográficas. *Ciênc. saúde coletiva.* [Internet] 2014;19(10) [acesso em 24 jan 2016]. Disponível: <http://dx.doi.org/10.1590/1413-812320141910.09282014>.
20. de Andrade EC, Leite ICG, Vieira MT, Abramo C, Tibiriçá SHC, Silva PL. Prevalência de parasitoses intestinais em comunidade quilombola no Município de Bias Fortes, Estado de Minas Gerais, Brasil, 2008. *Epidemiol. Serv. Saúde.* [Internet] 2011;20(3) [acesso em 23 jan 2016]. Disponível: <http://dx.doi.org/10.5123/S1679-49742011000300008>.
21. Kamm KB, Feikin DR, Bigogo GM, Aol G, Audi A, Cohen AL, et al. Associations between presence of handwashing stations and soap in the home and diarrhoea and respiratory illness, in children less than five years old in rural western Kenya. *Trop. Med. Int. Health.* [Internet] 2014;19(4) [acesso em 23 jan 2016]. Disponível: <http://dx.doi.org/10.1111/tmi.12263>.
22. Mashoto KO, Malebo HM, Msisiri E, Peter E. Prevalence, one week incidence and knowledge on causes of diarrhea: household survey of under-fives and adults in Mkuranga district, Tanzania. *BMC Public Health.* [Internet] 2014;14(985) [acesso em 18 fev 2016]. Disponível: <http://dx.doi.org/10.1186/1471-2458-14-985>.
23. Saha D, Akinsola A, Sharples K, Adeyemi MO, Antonio M, Imran S, et al. Health Care Utilization and Attitudes Survey: understanding diarrheal disease in rural Gambia. *Am J Trop Med Hyg.* [Internet] 2013;89(1 Suppl) [acesso em 23 jan 2016]. Disponível: <https://doi.org/10.4269/ajtmh.12-0751>.
24. Farag TH, Kotloff KL, Levine MM, Onwuchekwa U, Van Eijk AM, Doh S, et al. Seeking care for pediatric diarrheal illness from traditional healers in Bamako, Mali. *Am J Trop Med Hyg.* [Internet] 2013;89(1Suppl) [acesso em 20 fev 2016]. Disponível: <https://doi.org/10.4269/ajtmh.12-0753>.
25. United Nations Children’s Fund (UNICEF). Committing to child survival: a promise renewed progress report. [Internet] 2013 [acesso em 22 jan 2016]. Disponível: [https://www.unicef.org/publications/index\\_70354.html](https://www.unicef.org/publications/index_70354.html).
26. de Oliveira JF, do Amaral JB, de Oliveira KF, Gonçalves JRL. Avaliação do impacto da vacina oral contra rotavírus humano no Brasil. *Rev. enferm. atenção saúde.* 2014;3(1):107-15.
27. Ministério da Saúde (BR). AIDPI Atenção Integrada às Doenças Prevalentes na Infância: curso de capacitação: atenção à criança de 1 semana a 2 meses de idade: módulo 6. 2ª ed. [Internet] Brasília: Ministério da Saúde; 2002 [acesso em 15 fev 2016]. Disponível: <http://pesquisa.bvs.br/brasil/resource/pt/ses-9353>.
28. Cervera DPP, Parreira BDM, Goulart BF. Educação em saúde: percepção dos enfermeiros da atenção básica em Uberaba (MG). *Ciênc. saúde coletiva.* [Internet] 2011;16(Suppl. 1) [acesso em 23 jan 2016]. Disponível: <http://dx.doi.org/10.1590/S1413-81232011000700090>.