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## Self-effectiveness in preventing diarrhea and child care: a transversal study

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### ABSTRACT

**Aim:** To check the association between the levels of maternal self-effectiveness to prevent child diarrhea and the conditions of health and healthcare provided to the children.

**Method:** This is a transversal study performed in the municipality of Fortaleza, Brazil, with 448 mothers of children under five years old. The interviews were taken using the Scale of Maternal Self-Effectiveness to Prevent Child Diarrhea. During the analysis, chi-square tests and Likelihood Ratio were used.

**Results:** A significant association was found between levels of self-effectiveness and the variables: care provided to the child out of the home ( $p=0.03$ ), only breastfeeding until six months old ( $p=0.001$ ), previous diarrheic episode ( $p=0.001$ ), the fact that the child has any pathology ( $p=0.020$ ), hospitalization of the child during the first month of life ( $p=0.038$ ) and vaccination against rotavirus ( $p=0.003$ ).

**Conclusion:** Self-effectiveness must be taken seriously during the development and implementation of interventions, with regards to improve maternal care provided to children.

**Descriptors:** Self-effectiveness; Child Diarrhea; Child Health

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## INTRODUCTION

Millennium Development Goals demanded a decrease child mortality rates by two thirds, between 1990 and 2015. However, as the end of the term gets closer, it is seen that there are still more than nine million deaths of children under five years old, 1.5 million of these deaths are provoked by diarrheic diseases, which are the second highest cause of death in children around the world<sup>(1)</sup>. In Brazil, although the number of child deaths due to diarrhea has decreased in the last few decades, the incidence of the disease is still high among this population, especially in the poorest regions of Brazil, such as the Northeast<sup>(2)</sup>.

In Fortaleza, in 2011, there were 3,452 notified cases of the disease in children under five years old, showing an increase when compared to 2010, when there were 2,115 notified cases of the disease in the same age group. In 2012, the data showed a significant rise when compared to the pervious two years, reaching 6,487 notified cases in children under five years old<sup>(3)</sup>.

These numbers reflect the present difficulty in controlling diarrhea, as countless determinant factors influence it, whether social, sanitary, immunologic, cultural or related to behavioral factors<sup>(4)</sup>.

In this context, children in general depend on other people's actions to survive, especially on their mothers, who are responsible for providing such caring. This research confirms this assumption, when it identifies the small understanding of the mothers in this matter, their lack of education and young age as aspects that influence whether children suffer acute diarrheic diseases<sup>(5)</sup>.

However, it is known that the current information given to the mothers and relatives of children, regarding the prevention and management of child diarrhea are insufficient to ensure that all children are supported properly before presenting complications<sup>(6)</sup>. Hence, it is imperative that health professionals insert the concept of self-effectiveness within the context of maternal care. Self-effectiveness affects people, motivating them to transform their actions, influencing the events that affect their lives, in the amount of effort they will expend and their will and persistence to overcome obstacles and adverse experiences, to promote their own health and that of their dependents<sup>(7)</sup>.

Thus, this study aimed to observe the association between the level of maternal self-effectiveness in preventing child diarrhea and the conditions of health and caring provided to children.

## **METHOD**

This is a transversal study, using a descriptive and analytic approach, undertaken with the mothers of children under five years old, residing in the municipality of Fortaleza, Brazil. The city is divided into six Regional Executive Departments (SER, in Portuguese), which are subdivided with technical support, financial and administrative autonomy. Each SER has a structure of Family Health Centers (CSF, in Portuguese), which are gateways to a hierarchical health system, to which the professionals working in Family Health Strategy belong. This study took place in six CSFs of this municipality from SER III, IV and VI, which were chosen based on the number of children enrolled in the studied age group.

The sample was chosen by convenience, based on a formula to calculate the child population ( $n = t^2_{5\%} \times P \times Q/e^2$ ), adopting a margin of error of 4%, thus reaching the number of 448 participating mothers. The inclusion criteria adopted was children under five years old, enrolled in one of the six CSFs selected by this research. Mothers with cognitive or mental problems were excluded because that would compromise their performance of the interview, as proposed by this research. We highlight that only the mothers of children under five years old were approached and invited to participate in this study, 100% of those mothers approached were willing to participate.

Data collection occurred between November 2009 and February 2010, at the CSFs, at the time the mothers were waiting to be assisted. We used the Maternal Auto-Effectiveness Scale to Prevent Child Diarrhea (EAPDI, in Portuguese)<sup>(8)</sup> and a form created especially for the research, which was validated<sup>(9)</sup> and pre-tested by the researchers<sup>(9)</sup>, dealing with socio-demographic characteristics and related to the children's health and the care provided to them.

EAPDI is a Brazilian instrument, validated and of proven reliability through Cronbach's alpha result 0.84, composed of 24 items distributed between two domains (family hygiene, with 15 items and; general/diet practices, with 9 items), to which answers vary according to Likert scale of 1 (completely disagree) to 5 (completely agree). Each mother, when answering the EAPDI, can choose only one of the five options, so that the total score goes from 24 to 120 points. The level of maternal self-effectiveness in preventing child diarrhea is considered low when the result is 109 or fewer points; moderate, from 110 to 114 and high when the score is 115 points or more<sup>(9)</sup>.

The data was organized and analyzed through the *Software Statistical Package for the Social Sciences* (SPSS), version 18. To analyze the association between the level of maternal self-effectiveness in preventing child diarrhea and the data related to the child's general health, as well as factors linked to the care provided to the infant, chi-square tests and likelihood estimation tests were performed, when the first tests did not satisfy the subject's particular conditions. For such tests, we established a significance level below 0.05.

This study was approved by the Ethics in Research Committee of Ceará Federal University, under protocol 92/09, respecting the norms established for research involving human beings.

## RESULTS

Regarding the characterization of participants by their socio-demographic attributes, the majority of the mothers studied were between 20 and 29 years old (n=231; 51.6%); they were married or in a consensual living arrangement (n=372; 83.6%); stayed 9.07 years in school (SD±2.85); worked from home (n=307; 69%); living under the poverty line, that is having a *per capita* income under a quarter of the Brazilian minimum wage (n=188; 43.8%).

On average, 4.45 people lived together in a single housing unit (SD±1.58), living for more than five years at the same address (n=211; 47.6%). The majority of the women

studied had only one child (n=200; 45.2%), most of them were female children (n=225; 50.2%) and were over three years old (n=163; 36.4%).

The majority of mothers reached a high level of effectiveness in preventing child diarrhea (n=224; 50.1%), those who reached a low level of self-effectiveness (n=118; 26.4%) were the second highest percentage of the total and those reaching the moderate level numbered the least in the survey group (n=105; 23.5%).

Table 1 revealed that the level of maternal self-effectiveness has a significant statistical relationship with the fact the child receives care outside the home (p=0.030) and exclusive breastfeeding up to six month old (p=0.001).

Table 1 – Association between the level of maternal self-effectiveness to prevent child diarrhea and factors related to the caring provided to the child. Fortaleza, 2010

Variable	Self-effectiveness						P
	Low		Moderate		High		
	N	%	N	%	N	%	
<b>Support from others while taking care of the child</b>							
Yes	16	6.4	44	17.6	190	76	0.522 <sup>a</sup>
No	17	8.7	29	14.8	150	76.5	
<b>Diarrheic episodes in the adults at home</b>							
Yes	5	6.6	14	18.4	57	75	0.833 <sup>b</sup>
No	29	7.9	59	16.1	279	76	
<b>Participation of adults in diarrheic episodes preparing meals</b>							
Yes	2	4.3	8	17.4	36	78.3	0.507 <sup>b</sup>
No	5	8.9	9	16.1	42	75	
<b>Caring provided to the child out-of-home</b>							
Yes	11	5.5	28	13.9	162	80.6	<b>0.030<sup>b</sup></b>
No	23	9.5	45	18.5	174	72	
<b>Previous contact with information regarding diarrhea prevention</b>							
Yes	9	6	24	15.9	118	78.1	0.391 <sup>a</sup>
No	24	8.2	49	16.7	221	75.2	
<b>Number of pre-natal consultations</b>							
1 to 6	11	7.4	25	16.9	112	75.7	0.956 <sup>a</sup>
7 to 13	23	8	46	16	219	76	
<b>Exclusive breastfeeding up to six months old</b>							
Yes	8	4.2	22	11.5	161	84.3	<b>0.001<sup>b</sup></b>
No	25	9.8	51	20.1	178	70.1	
<b>Search for health services at the time of diarrheic episode</b>							
Yes	17	8.2	48	23.2	142	68.6	0.190 <sup>b</sup>
No	3	5.8	8	15.4	41	78.8	

Source: developed by the authors

a – chi-square test

b – maximum likelihood ratio test

Source: Author's data

Table 2 shows the existence of a significant statistical association between maternal self-effectiveness in preventing child diarrhea and the previous occurrence of any diarrheic episode ( $p=0.001$ ), the fact the child is diagnosed with any pathology ( $p=0.020$ ), hospitalization of the child within the first month of life ( $p=0.038$ ) and immunization against rotavirus ( $p=0.003$ ).

Table 2 – Association between the level of maternal self-effectiveness to prevent child diarrhea and the data related to the health of the child. Fortaleza, 2010

Variable	Self-effectiveness						P
	Low		Moderate		Elevate		
	N	%	N	%	N	%	
<b>Prematureness of the child</b>							
Yes	7	15.6	6	13.3	32	71.1	0.101 <sup>a</sup>
No	27	6.7	67	16.7	308	76.6	
<b>Previous existence of any diarrheic episode</b>							
Yes	20	7.7	56	21.5	184	70.8	<b>0.001<sup>b</sup></b>
No	14	7.5	17	9.1	155	83.3	
<b>Abdominal pain or crying during child's evacuation</b>							
Yes	7	10.4	14	20.9	46	68.7	0.143 <sup>a</sup>
No	27	7.3	70	16.1	331	76.1	
<b>Pathologies</b>							
Yes	10	12.3	19	23.5	52	64.2	
No	24	6.6	54	14.8	288	78.7	<b>0.020<sup>a</sup></b>
<b>Number of diarrheic episodes of the child a month prior to the interview</b>							
1 to 2	1	5.6	5	27.8	12	66.7	0.459 <sup>b</sup>
3 to 4	2	10	3	15	15	75	
5 or more	2	12.5	5	31.3	9	56.3	
<b>Child hospitalization during the first month of life</b>							
Yes	11	14.3	14	18.2	52	67.5	<b>0.038<sup>a</sup></b>
No	23	6.2	59	15.9	288	77.8	
<b>Vaccination against rotavirus</b>							
Yes	16	5.1	48	15.4	247	79.4	<b>0.003<sup>a</sup></b>
No	12	11.7	23	22.3	68	66	
<b>Previous support with ORS* to the child</b>							
Yes	15	8.7	31	17.9	127	73.4	0.249 <sup>a</sup>
No	18	6.7	40	15	209	78.3	
<b>Previous hospitalization of the child due to diarrhea</b>							
Yes	2	5.4	10	27	25	67.6	0.630 <sup>a</sup>
No	18	8.1	46	20.8	157	71	
<b>Use of prescribed medication by the doctor against diarrhea</b>							
Yes	8	6.4	28	22.4	89	71.2	0.591 <sup>a</sup>
No	12	9.1	28	21.2	92	69.7	
<b>Use of homemade recipes when the child is in a diarrheic episode</b>							
Yes	10	6.7	32	21.5	107	71.8	0.487 <sup>a</sup>
No	10	9.2	24	22	75	68.8	
<b>Changes in the diet of the child during diarrheic episodes</b>							
Diet stays the same	3	4.1	19	26	51	69.9	0.505 <sup>b</sup>
Suspension of normal diet	5	8.2	13	21.3	43	70.5	
Improves the quality of the diet	12	10.3	23	19.8	81	69.8	

Source: developed by the authors

a – chi-square test

b – maximum likelihood ratio test

\*Oral rehydration solution

Source: Author's data

Furthermore, we call attention to the fact that 81 mothers that mentioned their children had some pathology, mentioned especially asthma (n=15; 18.5%), allergies in general (n=12; 14.8%), reflux (n=7; 8.6%) and lacto intolerance (n=5; 6.2%).

## DISCUSSION

It was seen that the association between maternal self-effectiveness in preventing child diarrhea with the fact the child received some care outside the home, which can be connected to the fact that those mothers work outside the home (n=138; 31%) and feel secure in leaving their children in daycare centers and schools, believing that their children are receiving proper care in these establishments<sup>(10)</sup>.

It is known that, third parties can influence behavior by demonstration and verbal persuasion, while demonstration is related to the observation of someone as a role model to show how to perform tasks correctly, verbal persuasion consists of stimulating people to face the situations that they imagined were beyond their capabilities<sup>(9)</sup>. In addition, this study found that the fact the mother had some help with the child from a third party did not interfere in her effectiveness in preventing child diarrhea (p=0.522), and it can be inferred that such sources of self-effectiveness (learning from practical example or by verbal persuasion) can be better used in the context of these mothers.

Another important finding deals with the lack of a significant statistical association between previous contact with information regarding the prevention of diarrhea and maternal self-effectiveness. Therefore we highlight the fact that health education is a relevant strategy, and meetings between health professionals and the community allow dialogue and information exchange between the two. However, undertaking these strategies does not guarantee behavioral changes in the daily lives of the families involved, it is imperative that there is an effective follow ups of these groups, as they feel empowered to adopt healthy habits in their families<sup>(6)</sup>.

It was also seen that self-effectiveness to prevent child diarrhea demonstrated a significant statistical association with exclusive breastfeeding up to six months old. This practice followed by a mixed diet up to the 24<sup>th</sup> month, can prevent more than one million child deaths per year worldwide. The majority of these deaths could be related to child diarrhea, as breastfeeding is the most effective intervention to protect children under the age of five against this harm<sup>(11)</sup>.

In addition encouraging mothers to breastfeed successfully empowers them<sup>(12,13)</sup>, and can be related to maternal self-effectiveness in preventing child diarrhea, as it is seen that breastfeeding children has an inverse proportional relationship with the studied pathology, and that both self-effectiveness practices are related to maternal care of their children<sup>(11)</sup>.

A transversal study in Qatar, with 1,278 children, identified that the risk of diarrhea was higher in those children fed milk formulas as babies (48.7%) and in those who were partially breastfed as infants (37,3%) in comparison to those children who were exclusively breast fed as babies(32,5%)<sup>(14)</sup>. Research performed in Fortaleza detected a prevalence of 12.4% of child diarrhea cases, on which 60% and 26.7% occurred among children who had not been breastfed at all and those whose breastfeeding period lasted less than six months, respectively, while among children who were still being breastfed and in those who were breastfed for at least six months, diarrhea appeared in 6.6% of the cases<sup>(15)</sup>.

Another variable that demonstrated a significant statistical relationship with maternal effectiveness in preventing diarrhea was previous occurrences in the child, the highest self-effectiveness ranks were found in families in which the children had never shown any diarrheic episode ( $p=0.001$ ), or any pathology ( $p=0.020$ ), as well as in those cases where the children were not hospitalized during their first month ( $p=0.038$ ).

Thus, it is seen that maternal self-effectiveness in preventing child diarrhea was always related to good health and healthy behavior among the children, inferring that these mothers feel confident in their ability to care properly for their children. Other studies indicate that self-effectiveness is a powerful predictor to preventive behavior related to child health and infant care<sup>(16-17)</sup>.

Besides that, maternal effectiveness in preventing child diarrhea also showed an association to the anti-rotavirus vaccination, inferring that those mothers, who are effective in caring for their children recognize the importance of immunization to child health the National Immunization Program, run by the Brazilian Ministry of Health, pays

special attention to rotavirus, because in the Brazil, infection by this pathogenic is one of the main causes of acute diarrhea, dehydration and death, especially among children, under five years old<sup>(18)</sup>.

The diarrhea prevention package organized by the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO)<sup>(1)</sup> emphasizes the necessity of promoting vaccination against rotavirus, based on its proven effectiveness, thus making this task a fundamental action to prevent child diarrhea, because it is children's vulnerability to infections that potentiate the occurrence and the acuteness of these episodes<sup>(19)</sup>.

In this sense, educational actions must be targeted so the mothers with high maternal effectiveness stay on this level, and those having a low or moderate maternal effectiveness can participate in the strategies that will give them the opportunity to choose health promoting behavior, either individually or communally.

We must say that previous experiences are important sources to develop the expectancy of self-effectiveness, as the mother can observe the care provided to the child, permitting reflection and positive changes in their own conduct, because maternal perceptions can influence the environmental control, activities and the exposure of children to determining factors to diarrhea<sup>(20)</sup>, as well as to the promotion of health.

## **CONCLUSION**

The results of the present study proved a significant statistical association between the level of maternal effectiveness in preventing child diarrhea and some factors related to the care provided to the child. We believe that specific characteristics can influence maternal effectiveness, generating some insecurity in caring for the child, such as: the fact that the child receives care outside of the home, a previous diarrheic episode, diagnosis of any pathology and being hospitalized during the first month of life. The results of this study, infer that a mother is more confident in preventing child diarrhea,

when the child is exclusively breastfed up to six months old and is also vaccinated against rotavirus.

Therefore, nurses must identify maternal effectiveness in preventing child diarrhea, so to intervene with health education strategies, especially with those mothers with lower self-effectiveness scores. Thus, health professionals must encourage and help the mothers in order to feel more capable in implementing care methods, which prevent diarrhea in their children, as self-effectiveness is a cognitive variable, which is essential to motivate and execute any action or behavior related to health.

One limitation to this study is the possibility of some bias from the interviewed mothers, when they were asked about the events that occurred during the past five years, which was the maximum age of the investigated children. It is suggested that there is a necessity to amplify the investigations in the field of maternal self-effectiveness, using prospective and comparative approaches, aiming to establish cause-and-effect relationships in the occurrence of child diarrhea.

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