

The child's body without fluid: mother's knowledge and practices about hydration and rehydration in Salvador, Bahia, Brazil

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ABSTRACT

Background The aim of this article was to anthropologically analyse knowledge and practices about hydration and rehydration in a specific ethnographic context, where diverse therapies are combined to treat and take care of child diarrhoea as part of a wider social process that circumscribes transactions between self-care and biomedicine.

Methods Ethnographic data from a qualitative study in the neighbourhood of Nova Constituente (Salvador, Bahia) which was part of an interdisciplinary project aimed at epidemiologically evaluating an environmental sanitation programme. These data results from a series of in-depth interviews of 29 interviewees and field observations collected over two stages (1997/1998–2003/2004).

Results Knowledge about hydration and rehydration is practical knowledge that demonstrates some of the cultural limits of dehydration in terms of the normality or pathology criteria related to child diarrhoea. This knowledge belongs to local interpretations, treatment experiences and the care that mothers provide in relation to their child's diarrhoea. We observed a process of medicalisation in the discourse about hydration and self-care.

Conclusions Unlike rehydration, hydration is structural to self-care processes. While the former constitutes a way of alleviating diarrhoea, the latter is a type of care centred on healing. The difference between these practices does not lie in the type of remedies used but in the meaning attributed to them and the way they are combined.

INTRODUCTION

In the late 1970s, the WHO developed oral rehydration therapy (ORT) and with UNICEF, began several vertical dissemination programmes aimed at combating child mortality related to diarrhoea. In 1980, they initiated a control programme specifically designed to treat this type of disease.¹ When the WHO realised that the child death rate had dropped from 25% of the child population in 1960 to 18% in 2005, this inexpensive, easy-to-prepare, easy-to-obtain ORT was seen as one of the 20th century's major discoveries.² Between 1979 and 1992, the number of saline solution packets issued to Third World countries rose from 51 to 800 million per year.³ During this period, primary health providers were in charge of recommending the provision of packets through educational programmes run by community health agents.

Despite the great success achieved till date,⁴ diarrhoea still remains the second leading cause of

global child mortality. Given that the fourth Millennium Development Goal aims to reduce child mortality, in 2009 the WHO published a statement about the growing need to resume research on childhood diarrhoea to improve access to ORT and zinc supplements.⁵

In the 1980s, anthropological work on childhood diarrhoea, dehydration and rehydration focused on an analysis of ORT and oral rehydration solution.⁶ Many studies emphasised the ethnomedical approach,^{7–9} applied rapid ethnographic methods¹⁰ to analyse the effectiveness of medical campaigns,^{11–13} examined the potential role of popular healers as effective mediators in the spread of these therapies^{14–17} and described how mothers used these therapies.^{18 19} Only two anthropological studies focused on the cultural meanings of dehydration.^{20 21} During the same period, other qualitative research projects explored the treatments used for cases of diarrhoea and the beliefs related to these. Households²² and maternal ideas²³ were the focus of analysis.

In the 1980s, the Northeast region in Brazil had one of the highest child death rates. ORT therapies began to be analysed in order to determine whether they were effective as a means to control child mortality and morbidity in acute episodes of diarrhoea.^{24 25} Gastroenteric diseases and various types of dysentery feature as the main causes of child mortality according to several studies which focused on mothers' perceptions.²⁶

In the 1990s, certain published papers evaluated the positive impact of ORT on reducing morbidity and mortality in childhood diarrhoea.^{27 28} Anthropological work regarding diarrhoea set aside the role of the healer and became more aware of the mother's role in selecting treatment.²⁹ The outbreak of the 1991 cholera epidemic in Latin America led the WHO to prioritise international policies that involved improving access to drinking water, investment in sanitation and the promotion of healthy behaviour.³⁰

Between the 1990s and the first decade of the millennium, a great deal of epidemiological and interdisciplinary research was carried out.³¹ Anthropological and epidemiological methods were applied to analyse hygiene behaviour within households.^{32 33} Some focused on evaluating health education programmes and measures³⁴ such as hand-washing with soap^{35 36}; sanitation measures, such as sewage system implementation³⁷ or the use of latrines.³⁸ The study of environmental risk factors on the development of childhood diarrhoea^{39 40} became significant.

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In the same period, epidemiological evaluations of the oral rehydration dissemination programme continued to be published.^{41–42} Qualitative studies about diarrhoea focused on self-care,⁴³ caretakers⁴⁴ perspective and hygiene habits within households,⁴⁵ as well as on the introduction of zinc tablets to complement ORT.⁴⁶ Anthropological studies continued to focus on mothers' beliefs and practices about diarrhoea.⁴⁷

The aim of this article was to anthropologically analyse knowledge and practices related to dehydration, hydration and rehydration in a deprived urban peripheral neighbourhood in Salvador (Bahia, Brazil). The article covers two stages of fieldwork: the first stage includes the period from 1997 to 1998, while the second stage runs from 2003 to 2004. The starting point is an analysis of mothers' discourses about their experience of the care and treatment of childhood diarrhoea. A combination of various therapies is analysed as part of a wider social process involving transactions between the self-care and biomedical models.⁴⁸

In the late 1990s an environmental sanitation intervention took place in the city. An interdisciplinary approach was used to assess epidemiological effects in reducing the morbidity associated with childhood diarrhoea.^{49–50} Other interventions, such as the implementation of the Family Health Program⁵¹ and its impact on reducing child mortality,⁵² were also analysed.

We believe that hydration and rehydration are practical skills that reveal certain cultural limits in relation to dehydration. These skills are part of the local understanding and experiences that mothers acquire to perceive, relieve, treat and cure childhood diarrhoea. Childhood diarrhoea, which is perceived as a common disorder, requires more in-depth qualitative studies during a long period of time from the mother's point of view in order to better understand the integration of self-care practices, self-medication and biomedical care.

Dehydration is a central element in developing normality and pathology criteria. This article analyses the aforementioned skills and practices as part of a specific social process.⁵³ Priority is given to three topics: the social and cultural dimensions of childhood diarrhoea,⁵⁴ the social experience⁵⁵ of the dehydrated body and the medicalisation^{56–57} of self-care. Local

world of social experience is a determinant of the suffering and illness process.

METHODS

The results presented in this paper are based on the qualitative analysis of ethnographic data coming from an anthropological study of childhood diarrhoea and sanitation in Nova Constituinte, a Salvador (Bahia) periurban district. This study was part of an interdisciplinary epidemiological assessment project about the impact of the 'Bahia Azul' environmental sanitation programme,⁵⁸ in which the topic of the diarrhoea was central in the investigation in regard to the absence of sanitation, and the hydration and dehydration were part of the beliefs on diarrhoea. Ethnographical data of hygienic behaviours were not explored in this paper.

In this specific ethnographic context, the article analyses, through the mothers' narratives, the knowledge and practices of hydration and rehydration, where diverse therapies are combined to treat and take care of child diarrhoea as part of a wider social process that circumscribes the transactions between self-care and biomedicine's explanatory models.⁵⁹ So, mothers' explanatory models⁶⁰ show their beliefs about diarrhoea and about what can happen as a result, when they should intervene, and the therapeutic practices to prevent and treat diarrhoea (hydration and rehydration) (tables 1 and 2).

RESULTS

Nova Constituinte periurban district

In this research, the historical time period is significant because of the positive changes that occurred in the neighbourhood during this time. First, a degree of urban sanitation development was seen in the construction of sewers (1999) and the implementation of this system (2003). Moreover, primary healthcare coverage was expanded through the construction of the local health centre (2003) and the implementation of the Family Health Program (2004). This programme involved the training and mediation of community health workers living in the neighbourhood. Health workers did not receive any training in ORT. Local and medical knowledge about this practice was extended

Table 1 Ethnographic fieldwork

Ethnographical data	Ethnographic data explored in this paper comes from 29 in-depth interviews and fieldwork undertaken by three female ethnographers over two stages. One of them was the principal author of this article, and also coordinated and supervised all fieldwork. The first stage covers 10 months of fieldwork in 1997 and 1998, ^{61–62} and the second comprises 12 months of fieldwork in 2003 and 2004. Twenty-one months of follow-up work was undertaken between 1999 and 2002 and 2005 and 2008 The interviewees, whose choice was purposive according to the specific settings of the study, were in charge of at least one child under 5 years old. Of the 14 people in the first stage, 13 were mothers and 1 was a grandmother. The second stage included 15 people, 13 of whom were mothers, 1 was a father and 1 a grandmother (table 2). All participants were informed of the objectives of the study and their anonymity was guaranteed at all times. This anthropological study was integrated to an epidemiological research that was provided with the approval of the research ethics committee. Informed consent of the participants were required in both stages of the study, in conformity what is established in the 196/96 resolution on research involving human participants
Ethnobotanical study	An ethnobotanical study conducted in 1998 has also been taken into account. That particular study was conducted with the help of a biologist and was the primary source for the preparation of a catalogue of medicinal herbs that was distributed around the neighbourhood (the ethnobotanical study was only carried out in the first stage, because in the second one a decrease of the use of medicinal herbs was observed and it was not considered to be necessary to do a new collection)
Ethnographical techniques	The ethnographic techniques included in-depth interviews on the health-disease-care process, acquisition of life histories and genealogical data, observations on health and sanitation, production of district maps and house plans, filming, photography and community activities before and after installation of the sewage system. Ethnographic data were collected in informants' homes and in the neighbourhood All audio tapes were transcribed in Portuguese by three granted students and one qualified person with experience. Later, the interviews and their narratives were analysed in order to be able to identify themes and topics and an exhaustive exploitation of the data were obtained through the software for qualitative analysis ATLAS-TI 6.2. The principal author of this paper participated in both stages as ethnographer and research coordinator. The second one helped to analyse the ethnographical data To achieve quality, trustworthiness, rigor and dependability ⁶³ various measures were applied. Members of Research Group reviewed the transcriptions several times, participated in a systematic analysis of ethnographical data and carried out numerous discussion sessions regarding the results

Table 2 Informants' sociodemographic characteristics

Characteristics	1997/1998 N=14	2003/2004 N=15
Kinship		
Mother	13	13
Father	0	1
Grandmother	1	1
Marital status		
Cohabiting but unmarried	12	7
Married	0	2
Separated	1	6
Widowed	1	0
Age (years)		
<20	2	1
20–25	4	4
26–30	1	8
31–35	5	0
35+	2	2
Occupation		
Housewife	9	8
Sells from home	0	3
Sells on the street	1	2
Sells in an establishment	0	1
Domestic worker	4	0
Pensioner	0	1
Educational level		
Illiterate	1	0
Primary school (first educational level)		
Primary I (up to 4th grade)		
Primary I (incomplete)	6	0
Primary I (complete)	1	4
Primary II (from 5th to 8th grade)		
Primary II (incomplete)	5	7
Primary II (complete)	0	0
Secondary school (from years 1 to 3)		
Second school (incomplete)	1	3
Second school (complete)	0	1

before the beginning of this research. A community centre was built during this period. This centre housed the neighbourhood association founded in 2003. A new association was established and new Pentecostal churches opened up (table 3).

The women interviewed in the first stage knew about and used rehydration techniques, although there was no health centre in the neighbourhood. During the second stage, once the poor and underused sewerage system had been implemented, positive perceptions regarding a reduction in problems such as diarrhoea and intestinal parasitosis contrasted with negative perceptions about internal inequalities related to system weaknesses.⁶⁴

Childhood diarrhoea

Our research shows that mothers perceive dehydration as a cause for alarm in relation to diarrhoea and, particularly, to a certain social criteria of severity (frequency of disease, faeces texture, etc) as well as to cultural features attributed to a normal child's body (physical conditions and behaviour). Mothers, agreeing with the medical definition,⁶⁵ use the concept of diarrhoea to refer to the passage of three or more loose or liquid stools per day, or more frequently than is normal for the child.

Diarrhoea eliminates impurities from the child's body, but these impurities are not always seen as signs of disease, as discussed below. When these impurities are seen as signs of disease, recognition is made from a combination of a range of symptoms (fever; vomiting; loose, bloody or greenish stools), body changes (weight loss, skin changes, etc) and behavioural changes (weak, frail, ailing, etc) (table 4). They then deploy a series of symbolic meanings that in turn lead to various actions.

At first, mothers perceive childhood diarrhoea as a 'common problem', a 'mild', 'stupid' or 'banal' disease (*besteira*). The severity criteria of this syndrome are related to excess, to something that goes beyond the limits of what is considered normal. Although it is not considered dangerous, the presence of diarrhoea always leads to rehydration practices. Although these practices may be varied, intermittent and with varying degrees of intensity, they are the result of self-care processes that try to make up for the loss of body water. Other symptoms or diseases often occur alongside diarrhoea.

Dehydrated body

Dehydration is related to 'excessive loss of body water' (eg, persistent diarrhoea). Although all human activities that imply physical effort or hot weather can lead to loss of body water and thus liquid consumption, people do not perceive the ingestion of liquid due to thirst and the practice of hydration as being equal. The practice of hydration implies some specific knowledge about the limits of physical normality based on an idea of balance—if something is excessive it needs to be balanced—but drinking due to thirst is a survival instinct response. Hydration is part of a self-care process that aims to restore the body's normal condition (see online supplementary web table S1). This practice functions as a precautionary measure, since it is an attempt to prevent a disorder worsening further.

From the mothers' point of view, a child's body is much more vulnerable than that of an adult and that is why the child needs to be cared for. Nevertheless, children are not strictly supervised in their daily activities. Mothers get alarmed when their child's physical condition or behaviour is affected by a loss of vitality that they consider unusual. Some of these bodily changes express health issues. Growth disorders usually function as a worrying sign. Normal growth processes include weight gain, game playing or teething (table 5). Hydration is seen as a precautionary measure when a young child is teething, in order to avoid the potential effects of dehydration.

Beverage consumption (water, herbal tea, coffee, soft drinks, juice and saline solutions) is part of the local food culture and is also a self-care practice. It takes place in two separate social settings which correspond to different symbolic realities within Brazilian existence⁶⁶: the household, which represents the domestic sphere of privacy, trust and parental relationships and the street, which constitutes the public space that involves danger, hostility and conflict.

Mothers did not serve water at lunchtime during either of the two fieldwork stages; instead they provided fruit juice or a carbonated drink. Coffee is served hot, and is usually taken in the morning or evening. Soup is taken in the evening. Herbal teas are used to treat disorders or diseases. Plain water is used to quench thirst, but juices (figure 1) and herbal teas (figure 2) are used to hydrate and saline solutions (see online supplementary web figure S1) are used to rehydrate (table 6). Both practices are palliative treatments for dehydration.

During the first stage, weakness (*corpo fraco*) was treated with vitamin consumption. The idea of a vital and vigorous body was culturally associated with energy. Lack of energy owing to

Table 3 Nova Constituinte periurban district

	First stage (1997–1998)	Second stage (2003–2004)
Population (*)	9748 inhabitants (database of 1996 census obtained from the Brazilian Institute for Geography and Statistics (IBGE))	18077 inhabitants (database of 2000 census obtained from the Brazilian Institute for Geography and Statistics (IBGE))
Urbanisation	Neighbourhood formed from informal land occupation that began in early 1980 Families from other neighbourhoods who bought land after the informal land occupation Families relocated by the council after being left homeless due to heavy flooding or relocated after being evicted from the historic centre of the city after a process of gentrification Unpaved streets, opencast sewage and the accumulation of waste Houses made of mud, wood and brick	Implementation of the reform programme included in the <i>Estatuto da Cidade</i> and distribution of Certificado Especial de Moradia (CEM) (2003–2004) Property sale in some specific areas due to violence problems Unpaved streets, the coexistence of opencast sewage with a damaged sewerage system and sewers in good condition. Worsening condition of the streets
Sanitation	Sewerage system nonexistent. Lack of surface water drainage. Beginning of construction works for the sewage system Houses without toilets. Some have rainwater tanks. Faeces are deposited in plastic bags and thrown into the refuse	Enlargement of houses and advances in their construction Beginning of household connections to the sewerage system. Difficulties in maintaining the network: broken pipes, network flooding and obstructions in the sewers. Surface water drainage still not constructed First toilet facilities
Water supply	Drinking water distributed across the whole area. The system is inadequate due to water quality and irregular supply; sometimes there is no water on several consecutive days	Progress in the supply of drinking water with increased frequency of distribution
Refuse collection	Inadequate refuse collection system. Existence of clandestine dumps in the neighbourhood	Progress made in the refuse collection system. Containers placed on the streets and the partial elimination of clandestine dumps
Services	Without public transport (buses) inside the district. Nearest at 15 min walking Existence of community associations, community schools, a range of businesses, evangelical churches and <i>candomblé</i> (an Afro-Brazilian religion) worship houses	First private initiative of mini-buses inside the district that was suspended a few months afterwards. Introduction of a private service of motorcycles inside the district Construction of the health centre (2003) and beginning of the Family Health Program with local 13 health workers (2004) Increase in the number of evangelical churches and other establishments
Socioeconomic characteristics	Most women are housewives and their husbands live from informal economy and small temping. Working women are usually domestic workers They uninterruptedly receive milk supplements from social programmes, support for children under 14 so they do not have to work and grants for buying butane gas	Women combine their occupation as housewives with the informal economy (selling products at home or on the street) or as domestic workers. Men work in the informal economy as construction workers They regularly receive the <i>Bolsa Família</i> (government's programme which consists of an economical aid), depending on the number of children and wages (social programme of the Federal Government)
Health characteristics	The major child's health problems are malnutrition, diarrhoea and respiratory diseases (not available epidemiological data on morbidity and mortality in the neighbourhood) In the district there are local treatment resources as healers (<i>rezadeiras</i>) who pray the evil eye and fright and medicinal plants sellers (<i>raizeiras</i>) that are often required by the people Despite the existence of Afro-Brazilian religious cults, priests were seldom asked to solve common child's health problems such as diarrhoea and respiratory diseases Mothers combine self-care and self-medication practices, more that health services available in the neighbouring district	The major child's health problems are respiratory and skin diseases, as indicated by community health workers. However, there are still cases of malnutrition and diarrhea in some areas of the district (not available epidemiological data on morbidity and mortality in the neighbourhood) Health workers perform home visits for vaccinations and weight/size control, programme specialist's visits, distribute prescribed drugs that are arriving late and facilitate emergency and hospitalisation Self-care and self-medication continue to merge with a decrease in intervention of <i>rezadeiras</i> and <i>raizeiras</i> Spiritual health problems, especially in adults, are required in Afro-Brazilian Candomblé centres and evangelical cults

*Data were obtained by summing the populations living in the census tracts corresponding to this district.

excessive work or poor diet was usually treated with vitamins or increased sugar consumption. Although the word 'vitamin' is used to designate a drink made of bananas and milk, mothers chose from a wide range of vitamins bought in the pharmacy. By the second stage this habit had reduced dramatically.

In the 1990s Brazil became the third largest soft drinks market in the world.⁶⁷ In 2002, the non-carbonated beverage sector had increased by 34%.⁶⁸ Currently, fruit juices occupy 75% of the market. Soft drinks are replacing fruit powders in popularity. The success of drinks based on fruit juice is related to the persistently healthy images seen in advertising. Actually, the industry of bottled water uses the scientific principle of hydration to stimulate consumption.⁶⁹

The Northeast region has 27.8% of Brazil's population and is the leading consumer of non-alcoholic drinks (20.3%). The country has recently considered establishing a tax to reduce the consumption of sugary beverages within households.⁷⁰ According to WHO standards, Brazil is the world's leading consumer of sugar.⁷¹

Medicalisation of hydration

Rehydration involves methods of care and self-medication.⁷² Care occurs when a mother goes to a doctor after a number of days of childhood diarrhoea and leaves the clinic with several saline solution packets. Self-medication occurs when this practice has already been learnt by mothers in the doctor–patient relationship and when packages are free and easy to obtain in health centres. This widespread practice is combined with other hydration measures and with self-medication practices, which include antibiotic pills to help reduce the severity perceived by mothers. For mothers, when certain kinds of diarrhoea begin to be classified as diseases, 'doctor's remedies' are stronger and more efficient than their own (box 1).

The use of the term 'rehydration' occurs with the use of saline solutions. These are distributed free of charge by health centres and must be dissolved in boiled water.

Thus, oral rehydration and boiled water are healing practices that have become incorporated as a result of paediatric instruction. Nevertheless, the adoption of these practices as normal

Table 4 Mothers' perceived causes of child's diarrhoea

1997–1998		2003–2004	
Nutrition	Social conditions	Nutrition	Growth
Deficits, excesses, changes	Low economic status	Deficits, excesses, changes	Teething
Food excess	Medical care	Bad nutrition	Body
Palm oil	Reaction to injections	Lack of nutrition	Infection
Margarine	Reaction to antibiotics	Lack of milk	Heat in the bowel
Malnutrition	Lack of medical responsibility	Continued breastfeeding	Child behaviour
Weaning	Growth	Preparation and conservation	Putting dirty things in the mouth
Preparation and conservation	Teething	Greasy	Dirty hands
Greasy	Body	Expired	Walking barefoot
Fried	Swallowing liquid during childbirth	Spoiled	Walking barefoot through refuse
Too much sugar	Infections	Badly cooked	Playing in the refuse and sewage
Badly made porridge	Intestinal Infections	Badly made	Playing under the sun
Spoiled food	Infections from breast milk	Sour	Not drinking water
Food leftover from the previous day	Lack of liquid	Leftover from the previous day	Adult behaviour
Unwashed fruit	Uncontrolled bowels	Cold	Lack of hygiene
Problems associated with milk	Child behaviour	Very Hot	Lack of experience
Kind of food	Walking barefoot	3 days out of the fridge	Lack of care
Heavy	Playing with hands in soil	Badly washed or unwashed food	Breastfeeding during pregnancy
Strong	Stepping on rubbish	Porridge leftover from the previous day	Breastfeeding after coming back from the street
Beef stew with beans	Eating rubbish	Unboiled porridge	Not washing child's hands
Calf's foot and tripe stew (mocotó)	Eating bricks	Uncooked porridge	Not putting fresh clothes on the child
Desserts	Adult behaviour	Kind of food	Diseases
Environmental	Irresponsible	Pork meat	Diarrhoeal diseases
Climate changes	Lack of experience	Palm oil	Parasitic worms
Heat	Not giving water to child	<i>Vatapá</i> (a doughy mixture of dried prawns, peanuts and bread)	Parasite attack
Too much heat	Allowing the child to be exposed to the sun	<i>Acarajé</i> (a fried ball of mashed black-eyed peas and dried prawns)	Dysentery
Muggy weather	Diseases	Avocado	Dengue
Mud	Diarrhoeal diseases	Hot mango	Intestinal infection
Pollution	Parasitic worms	Too many oranges	Droopy belly (<i>ventre caído</i> or <i>vento caído</i> —a form of diarrhoea only curable by a healer)
Contaminated water	Parasite attack	Packaged milk	Evil eye
Water with microbes in it	Evil eye	Too much coffee	<i>Susto</i> (sickness due to fright)
Running water	Droopy belly (<i>ventre caído</i> or <i>vento caído</i> —a form of diarrhoea only curable by a healer)	Manioc flour	Related diseases
Unfiltered water	Dysentery	Bean husks	Flu
Untreated water	Intestinal infection	Corn flour	Catarrh
Lack of basic sanitation	Gastritis	Filled biscuits	Risks
Sewage	Related diseases	Chocolate during the hot season	Can kill
Rubbish	Flu	Eating out	Quick death
Dirt	Catarrh	Sausages	Parasites kill
Stench	Fatigue	Fried chicken croquettes (<i>Coxinha</i>)	Dehydration kills
Vectors	Risks	Snacks	
Parasites	Death	Environmental	
Bacteria		Heat	
Microbes		Pollution	
Germs		Untreated water	
Flies		Rat or dog faeces	
		Flies on refuse	
		Refuse	
		Lack of basic sanitation	
		Lack of septic tank	
		Sewage	
		Dirt	
		Stench	
		Vectors	
		Parasites	
		Bacteria	
		Microbes	
		Viruses	
		Rats	

Table 5 Mothers perceived symptoms in dehydrated children and children with diarrhoea

1997–1998		2003–2004	
Pain		Pain	
Belly	Loss	Belly	Loss of appetite
Head	Loss of appetite	Head	Weight loss
Teeth	Not wanting water	Intestinal	Getting thin
Fever	Weight loss	Colic	Malnourished
Strong	Getting thin rapidly	Suffering	Anaemic
Head burning	Loss of liquid	Fever	Loss of liquid
Vomits	Too much liquid loss	Fever	Loss of liquid
Vomits	Body with no liquid	Vomits	Lack of liquid
Crying	Dehydration	Vomits	Lack of liquid in the bowel
Cries without tears	Behaviour changes	Crying	Dried up inside
Faeces consistency	Weak	Too much	Dehydrated
Watery	Awkward	Faeces consistency	Behaviour changes
Soft	Depressed	Pure water	Only wants liquid
Viscous	Submissive	Soft at all times	Weak
Thin	Being a softie	Soft and sometimes bloody	Awkward
Greasy	Fatigued	Thin	Submissive
Foamy	External signs	Small blobs	Despondent
Acute diarrhoea	Belly	Strange	Sad
Liquid diarrhoea	Big-bellied	Different	Different and strange
Profound diarrhoea	Wrinkled belly	Faeces Colours	Restless
Faeces Colours	Swollen belly	Yellow	Smelly
Yellowish	Full of worms	Green	Depressed
With flecks of blood	Skin	Faeces Smells	Stretched out
Greenish	Changes	Bad smell	On mother's lap
Faeces Smells	Sticky	Strange smell	Dizzy
Smells bad	Face	Terrible	Lifeless
Strong	Pale	Stinking	Dull
Horrible	Eyes	Rotten	Not having sufficient strength to play
Repugnant	Sunken	Defecation	Not wanting to walk
Fetid diarrhoea	Lips	Frequency	Wanting to sleep all the time
Defecation	Swollen and reddish	All the time	Cannot be touched
Frequency	Purple	Over 3 days	In pain
Two, four or five times a day	Head	Frequent and different	External signs
More than four times a day	Sunken fontanel	Several times a day	Belly
Every 5 min		More than three times a day	Big-bellied
Soft all the time		More than four times a day	Skin
Loose bowel		Five or more times a day	Flaccid
Looks like running water		Every minute	Dry
			All skin and bone
			Grainy
			Face
			Pale
			Droopy face
			Eyes
			Lazy
			Sunken
			Droopy
			Dark circles under the eyes
			Head
			Sunken fontanel

treatments and the search for more efficient drugs to stop diarrhoea make many mothers believe they are not sufficiently effective. Some authors⁷³ have indicated a certain resistance because of the image of saline solution as a treatment for the poor. They assert that this cheap and simple therapy is reinforced through the use of antibiotic pills, because it fails to stop

diarrhoea at a time when mortality associated with this disease has been reduced (see online supplementary web table S2).

When we compared interview and ethnographic observation data from the first and second stages, a process of medicalisation in the discourse about hydration became apparent. In the first stage, the use of herbal teas and remedies was very diverse and

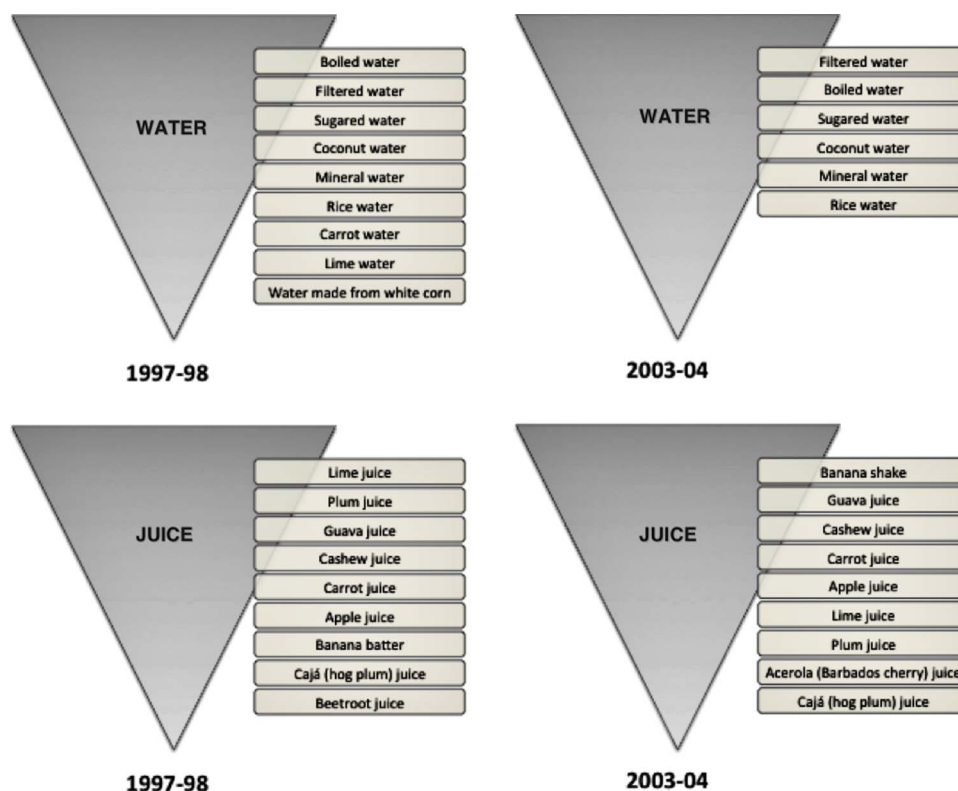


Figure 1 Water and juice consumption during diarrhoea episodes.

some mothers even planted these herbs in their backyards (see online supplementary web table S3).

The preparation of these herbal teas is usually based on medicinal herbs (leaves, seeds, stems, flowers, peels, etc) and they also combined different kinds of herbs and medicines. By the second stage, traditional hydration practices such as herbal teas had decreased. Instead, there was an increased use of fruit juice and less-varied medical herbs.

Some of the plants had popularly acquired the names of actual drugs, such as anador, penicillin, dipyrone, benzetacil and novalgina. The practice of phytotherapeutic medicalisation was more widespread in the first stage of the study. Home remedies included a mixture of medicinal herbs, fruits and medicine. This therapeutic option was less prevalent by the second stage of the study. Greater complexity in the production of home remedies was replaced by a greater variety of drugs through increased self-medication.

This rapid process of medicalisation can be linked to certain changes that occurred in the neighbourhood: a reduction in childhood diarrhoea and parasitic infections following the installation of the sewage system, the implementation of the Family Health Program, the role of community health workers as mediators and the increased consumption of manufactured foods and beverages. Especially, this process is related to important reforms in Brazil. First, the social programme of the Federal Government *Bolsa Familia*, implemented from 2004, which consists of an economic aid to the families that receive less than 1 monthly salary and a half. Second, the progress of the Unified Health System, with the progressive development of the Family's Health Program from 1999.

DISCUSSION

The experience of loss of body water is related to cultural models of the body, humoral medicine (cold/hot polarity)⁷⁴⁻⁷⁶ and the child's behaviour in his or her daily life.

Dehydration is perceived as 'excessive loss'. This 'excess' is something that is exceptional, more than expected, out of place and no longer reasonable. In a social sphere in which shortage, for example, lack of food, money and basic infrastructure, is the usual experience, excess is difficult to imagine. But excess also causes diarrhoea: an 'excess' of spoiled food, of parasites, of dirt and refuse, etc.

Under these social and economic conditions 'excessive loss of water' means that the body is in great danger (eg, persistent diarrhoea).⁷⁷ Perspiration is a normal indicator that removes body fluids due to physical exertion. Diarrhoea, however, accelerates loss of body fluids and, therefore, leads to an imbalance in the body. 'Excess' is due to *quentura* (excessive heat in the body or bowels), diarrhoea or warm weather. This naturalistic explanation about the origin of fluid loss refers to a process of naturalisation⁷⁸ of the social causes that explain why fluid loss is perceived as a health risk. This kind of perception is related to social order and disease categorisation systems.⁷⁹

Rehydration occurs upon recognition of a physical imbalance that can affect the child's health. This imbalance is recognised through several signs and symptoms, most notably the symbols related to bodily changes. The mothers' experience and perception of the notion of balance (the boundary between normality and pathology) is applied to the child's physical condition and behaviour and thus affects the choice and combination of home hydration therapies: medicinal herbal teas, vegetable or cereal water and fruit juices.

Water quenches thirst but fails to hydrate. This is why water needs to be manipulated and transformed. A liquid capable of hydrating is achieved through herbal teas mixed with sugar, boiled vegetables and fruit. These ways of turning water into a treatment to alleviate common diarrhoea constitute some of the self-care practices applied to these disorders.⁸⁰ As with food

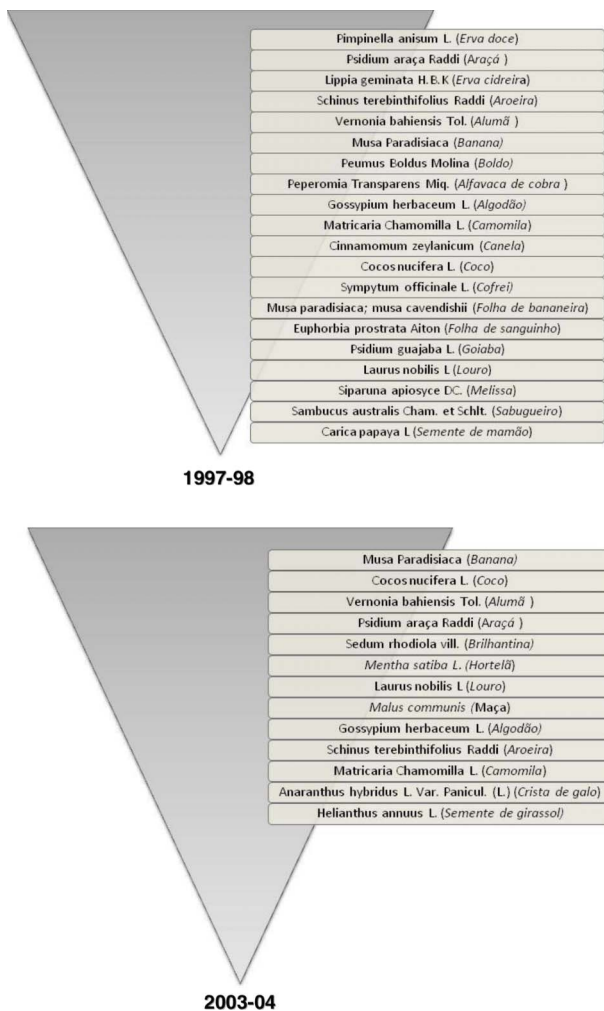


Figure 2 Herbal tea consumption during diarrhoea episodes (Scientific and common Portuguese names).

preparation, hydration is a cultural practice that implies some knowledge about water and about the herbs and vegetables that are able to restore the body’s balance when it has been lost due to diarrhoea. Thus mothers learn how to turn water into a remedy that relieves and prepares the body for healing.

In our study, the difference between hydration and rehydration does not lie in the therapies employed, but rather in the meanings attached to these therapies and the ways they may be combined. The liquids used in hydration are care-oriented. Treatments usually involve changes in diet and increased liquid ingestion. However, rehydration implies an intensified combination of liquids, the use of saline solutions (homemade or supplied by health centres) and self-medication practices using antibiotics. As the perception of severity increases, more liquids, saline solutions and drugs are added.

The process of medicalisation of traditional knowledge about dehydration has helped mothers to seek more effective remedies to control and stop diarrhoea and to enhance their children’s mood and physical condition. For mothers, an effective drug should be able to stop the loss of fluids and the weakening process caused by diarrhoea, in the same way as vitamins. The dehydrated and weakened body represents a cultural image of shortage and the vulnerability of children⁸¹ that live in a context of great social inequality.

Table 6 Water, juice, herbal tea, drug and oral rehydration salt consumption during diarrhoea episodes

Water	Greater emphasis in the medical discourse about dehydration makes mothers more concerned about the risk of their children losing excessive liquid and they thus place greater stress on the importance of drinking water, especially during the second stage Boiled water, which is used to prepare oral rehydration salts, has turned into a home-made therapy for the treatment of diarrhoea
Juice	Between the first and second stages we observed a significant increase in the consumption of fruit juice to reinforce the weakened child’s diet For mothers, juice serves more to increase the weakened child’s energy than to heal the diarrhoea itself. This is why, as we can see in figure 1, some of these juices are not suitable for the treatment of diarrhoea
Herbal tea	By the second stage, there had been a reduction of this therapeutic option and a decrease in combining several plants Reduced complexity in the production of home remedies was replaced by a greater variety of drug use through self-medication
Drugs	Increased consumption of various medications (antidiarrhoeals, antibiotics, antipyretics, analgesics and vitamin complexes) occurred in the second stage. This practice responds to the search for therapeutic methods to jointly cure diarrhoea and other symptoms, such as fever, breathing problems and child weakness Mothers give children these drugs alongside other home remedies, rehydration salts and drinks to rehydrate the child
Oral rehydration salts	Oral rehydration therapy is so widespread that the oral rehydration salt bundle starts to be called home-made oral rehydration salts. It is not clear here whether the mothers use the envelopes distributed by the health centre (healthcare) or the water-based and sugar-based composition that they can prepare themselves (self-care)

Box 1 Self-care and self-medication processes.

- ▶ Hydration, unlike rehydration, is structural to self-care processes. This practice seeks to relieve a symptom or disorder through the development of a home remedy, while rehydration involves a specialised form of care focused on healing.
- ▶ Rehydration is associated with excessive dehydration perceived as a serious sign of diarrhoea.
- ▶ By the second phase, salts-based oral rehydration therapy was so widespread, both in distribution and preparation, that this practice had become a home remedy.

What is already known about this subject

- ▶ Thanks to an exhaustive review, we have observed that most anthropological studies of childhood diarrhoea that have addressed the issue of dehydration have adopted an ethnomedical approach with greater focus placed on an analysis of popular models for the classification of diarrhoea, local therapists’ knowledge and the impact of oral rehydration therapy.

What does this study add

- ▶ Our study explores the cultural models of the dehydrated body as well as hydration and rehydration from the mothers' perspective in a socioeconomic context of poverty. It takes into account an analysis of the use and combination of various alternative and home-made remedies, such as medicinal herbal teas; fruit juices; water from various cereals and boiled vegetables; and sweetened beverages, among others. Combining these therapies constitutes a set of structural practices for care, self-care and self-medication.
- ▶ The results of this qualitative study could be generalised to other periurban areas with similar socioeconomic characteristics and infrastructure (construction and implementation of sewage system, improvement of running water system and garbage collection), but the generalisations could not be extended to wider populations. Although a qualitative approach offers more richness and depth of understanding to this kind of researches,⁸² a weak point of this approach is that its results cannot be generalised as much as quantitative studies.
- ▶ A limitation to our research is that it does not evaluate the oral rehydration therapy programmes applied by the WHO in the past and its implications in periurban districts like this one.
- ▶ Our study may contribute to programmes of health promotion that take into account local cultural models on hydration and dehydration.

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