

Caregivers' Knowledge and Use of Fermented Foods for Infant and Young Children Feeding in a Rural Community of Odi, Gauteng Province, South Africa

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ARTICLE INFO	ABSTRACT
<p>Article type: Original Article</p>	<p>Background: Fermented foods have positive health effects in adults and children if consumed regularly. However, lack of knowledge and perceptions towards fermented foods may limit their usage. This study aimed to assess the caregivers' awareness and usage of fermented foods for feeding children in peri-urban/rural communities of Gauteng Province.</p> <p>Methods: A qualitative exploratory study was conducted in June, 2012, in a peri-urban/rural community to assess the awareness and use of fermented foods by child caregivers attending a local antenatal clinic through focus group discussions.</p> <p>Results: Thirty three caregivers participated in the study; however 29 indicated their demographic profiles. Four major themes that emerged from the analysis included knowledge on fermented foods, perceived benefits of fermentation, varied views about fermentation and feeding practices. Fermented foods that caregivers, their families and community members consume include <i>ting</i>, fat cakes, dumplings, sorghum beer and <i>magenu</i>. Findings also showed that children consumed fermented foods in form of soft <i>ting</i> porridge; and yoghurt, marketed as <i>Activia</i> and <i>Danone</i> commercial brands. Also, caregivers were not comfortable feeding their children with fermented foods, indicating their limited knowledge on the nutritional value of these foods.</p> <p>Conclusion: It is critical to promote caregivers' knowledge and use of fermented foods for feeding infants and young children in South African rural communities.</p>
<p>Article history: Received: Dec 07 2013 Accepted: Feb 24 2014 e-published: July 12 2014</p>	
<p>Keywords: Nutritional quality, Lactic acid bacteria, Health benefits, Traditional foods, Probiotics, Fermentation</p> <p>*Corresponding Author: Paul K Chelule Tel: +27 12 521 3330; e-mail: paul.chelule@ul.ac.za</p>	

Citation: Chelule PK, Mokgatle MM, Zungu LI, Chaponda A. Caregivers' Knowledge and Use of Fermented Foods for Infant and Young Children Feeding in a Rural Community of Odi, Gauteng Province, South Africa. Health Promot Perspect 2014; 4(1): 54-60.

Foods that have been matured using probiotic microorganisms are termed fermented foods. Consumption of indigenous fermented foods dates back to pre-historic times in many indigenous countries of the world.¹ Consequently, since 1960, manufacture and use of probiotics has increased significantly. In addition to improving the nutritional quality of foods, food fermentation

increases probiotic bacteria, such as lactic acid bacteria (LAB), in food.^{2,3} Probiotic fermented foods have been demonstrated to reduce childhood diseases such as diarrhea and malnutrition.^{4,6} For example, in clinical randomized trials (RCTs) performed in childcare centers, children fed with probiotic fermented milk had fewer and shorter episodes of diarrhea than those in the control

group.⁷⁻⁹ Similarly, probiotic fermented foods have a protective effect through the prevention of antibiotic associated diarrhea (AAD)¹⁰ and prevention of rotavirus shedding in hospitalized infants.^{11,12} It has also been demonstrated that long term consumption of fermented foods with live probiotic bacteria is not only safe and well tolerated by infants and young children, but leads to adequate child growth and development.¹³ These findings suggest that probiotic fermented foods may routinely be used for infant and children feeding. In South Africa, a number of fermented foods are available commercially while several of them are home-made. These include yoghurt, *amasi*, *magen* and *ting*, for example.¹⁴ In some South African ethnic groups such as the Batswana and Tsonga, some of these fermented foods form part of their staple diet.¹⁵ However, traditional preparation of these foods is largely uncontrolled (no starter cultures used) and no laid down guidelines are available. Furthermore, when people move to the urban areas they often give up traditional foods and adopt more westernized diets. Thus, as a word of mouth is passed down the generations, misconceptions on fermented food preparation may arise. This leads to variation in quality and stability of these food products.

Though they are easily available, these foods are seldom used to feed infants and young children. There is lack of researched reports on the reason why this is so. It is postulated that some of the major obstacles to consumption these important dietary foods is lack of knowledge on their preparation, usage^{16,17} and nutritional value.^{1,2}

This was a baseline study, designed to gather general community knowledge on their understanding of use and nutritional value of fermented foods in a rural community in Gauteng, in South Africa. The aim was to assess the awareness and use of fermented foods by child caregivers in the feeding of infants/young children in peri-urban/rural communities of Gauteng Province. The project also sought to find out the communities' awareness of the benefits de-

rived from feeding their children with fermented foods.

Materials and Methods

Study design

This study applied a qualitative design and focus group discussions, conducted at Odi Hospital in Gauteng Province. The participants were child caregivers, attending the antenatal clinic at Odi Hospital. They could be single parents (father or mother), foster parents or those entrusted with the task for one reason or the other, legally. The study was approved by Medical Research and Ethics Committee at the University of Limpopo. Permission was also sought from the clinic manager. Data was collected between January and May 2012.

Data collection

Focus group discussions were conducted with the child caregivers using a focus group discussion guide. As most clinic attendees were Setswana speaking, the guide was developed in English and translated into Setswana. Recruitment was done on the day that the caregivers were attending the antenatal care clinic. Caregivers were approached in the morning as they waited to be attended to by the healthcare workers.

The caregivers interested in participating, and met the study criteria, were informed about the study. They were then requested to give a signed informed consent. The FGDs were conducted in Setswana. With the permission of the participants, digital audio recorders were used to capture all focus group discussions, which lasted about 45-60 minutes. A total of 3 FDG were conducted in this study with an average of 10 caregivers per FGD. Caregivers' demographic data, such as age, education, employment status, number and age of children, were obtained using a self-administered questionnaire form. Data was collected until data saturation was reached. Saturation of data occurred when the last FGD discussion provided no new information from previously collected data.

Data Analysis

All recorded transcripts were first transcribed verbatim in the local language (Setswana) then translated into English by a trained transcriber who was fluent in Setswana language. The transcripts were further verified for accuracy of translation by one of the researchers who spoke Setswana and English as their first and second language respectively. For purposes of credibility, the researchers listened to tape recordings and checked the written transcripts for data accuracy. The researcher then read the transcripts several times to identify themes and categories relating to the knowledge and use of fermented foods for infant feeding. Final analysis through thematic content analysis was done on the three transcripts after they were uploaded into the NVivo version 8 software.

Results

Participants' Information

In total, 33 caregivers were recruited and took part in the three focus group discussions within the four weeks of the study. However, we managed to obtain the demographic details of only 29 caregivers. All the participants were women between the age of 18 and 44 years. All participants had at least a child below 5 years. The details of demographic profiles are shown in Table 1.

Themes

Four major themes emerged from the data, which are sources of knowledge on fermented foods, perceived benefits of fermentation, varied views about fermentation and feeding practices.

Sources of knowledge on fermented foods

They reported the fermented foods that their family and other community members consume are *ting*, fat cakes, dumplings, sorghum beer, *mageu*, homemade bread, and ginger beer. They also reported that children consume fermented foods in a form of soft *ting* porridge; and yoghurt, with specific

mention of *Activia* and *Danone* commercial brands.

Table 1: Socio-demographic profiles of the participants (n=29)

Demographic characteristics	n(%)	
Age (yr)	18-29	13(44.8)
	30-39	13(44.8)
	>40	3(10.4)
Marital status	Single	18(62.1)
	Married	10(34.5)
	Divorced	0 (0.0)
	Separated	1(3.4)
Education	Primary	7(24.1)
	Secondary	19(65.5)
	University	3(10.4)
	No education	0(0.0)
Number of children	1	8(27.6)
	2	12(41.4)
	3	3(10.4)
	4	4(13.8)
	5	2(6.9)
Employment status	Not employed	22(75.9)
	Employed	6(20.7)
	Pensioner	1(3.4)

There was a general consensus amongst the caregivers on the sources of knowledge about fermented foods as knowledge was passed down from parents, grandparents and relatives. They all reported that they did not get obtain any information on fermented foods from the health care workers.

I grew up my parents feeding us with these foods, they also taught us how to prepare them, we were taught as we grew-up, at home mostly we eat dumpling, we rarely eat ting unless when we've attended functions (A mother of 2 children).

I was taught by my grandmother, we used to watch them preparing it whilst we were still young, we kept on asking how to do it until we knew (A mother of 3 children).

The data also show that although they were given information on proper nutrition from

the clinic, they were never told about fermented foods by the health care workers.

At the clinic they tell us about nutritious food like vegetables, fruits, but not ting or fermented foods, it's you who can feed the child with fermented food if they are interested (A mother of 2 children).

Frequent reports from the caregivers showed that some of the fermented foods they knew and consumed were bought and others fermented at home. There was an overlap between some foods such as *ting* and *mageu* that could be fermented at home and also available at the retailers but the caregivers were not certain of the process that was used by the retailers when preparing fermented food.

You can pick-up the information about the nutrition for kids at home, some you'll get from school, clinic and some you can think for yourself (A mother of two children)

The issue is not about losing weight, the thing is, ting does not have enough starch like white pap (Another mother of 2 children).

When I buy grocery, I also buy Danone yoghurt for my child, but I once heard that Danone is not good for children's stomach and I slowed down in buying it for my child although kids do love Danone yoghurt (A mother of two children).

Activia yoghurt in older people helps with digestive system and you can't give a child something that will cause the child to have a runny stomach [diarrhoea] (A mother of 2 children)

Perceived benefits of fermented foods

The data collected also showed that the caregivers had varied perceptions about fermented foods. Some caregivers had positive perceptions that fermented foods were nutritious but only for adults.

Our grandmothers told us that it's nutritious... They say it's nutritious [as] it makes you to be strong....(Unknown caregiver. No demographic profile provided)

Some of the caregivers, however, had negative perceptions about fermented foods.

In some instances some mothers thought that fermented foods may be of lower quality than unfermented foods and can harm the children's health:

The reason why I don't feed my child ting [is because] they say [that] it causes the child to lose weight (A mother of one child)

I don't see the importance of feeding the infant with fermented foods... that's why I was saying that if you feed a child under the age of one year it causes phlegm (a secretion in the airway during disease and inflammation) [to develop] and ulcers and a child can't tell you that they have pain, ...when the child vomits check it, you'll see phlegm inside ... the child also becomes bloated time and again.. (Unknown caregiver. No demographics obtained).

Misconceptions on fermented foods

Caregivers provided both accurate information and misconceptions about the preparation of fermented foods. Caregivers described that they prepared food for fermentation by mixing dry ingredients such maize meal with water and left it in a warm place in a sealed container.

When I make mageu, I use... I take maize meal, I cook it and then cool it down, then I take flour, stir it and put it inside the bucket, then I put yeast (the one I use for making the fat cakes). (Named caregiver, FGD1)

Others said they added yeast to ingredients such as flour and others mentioned using baking powder and tartaric acid for fermentation. However, other caregivers reported immersing a tablespoon or a peeled potato as way of facilitating the fermentation process. These were all misconceptions of the fermentation process.

You can do it but most people who don't use the potato and the spoon, put in tartaric acid. This does not make ting to be nice (Mother of two).

Another misconception was that of caregivers reporting that they did not prefer feeding fermented foods to their children because of the sourness, which is not a pleasant taste, especially for the young ones.

I don't want to force the child, a you know ting is sour so I think it's not okay for the child, according to me I think the child does not like sour things (Mother of one)

Feeding Practices

Caregivers reported that fermented foods were generally consumed by them and their families. Although they mentioned that they also fed the fermented foods to their children, sometimes the children did not like them.

The child does not really like it, as you heard that I like [to] eat [it when it is] very sour, when I eat, I often give [it to] the child, sometimes the child eats it and sometimes not...I don't want to force the child [to eat it], as you know, ting is sour. So I think it's not okay for the child. According to me, I think the child does not like sour things (Mother of one Virginia FGD3).

Others said they ~~do~~ did not feed their children with fermented foods on a regular basis because of some perceived negative effects that they observed from the children. *I wouldn't because it would not treat the child well.... If a child is under five years, [he] does not eat Danone every day, [as] it causes mucus [to develop] just like a cough when a child coughs (Mother of two Unknown FGD3).*

One participant who was running a crèche' (Named Caregiver, FGD1) reported that she was feeding toddlers, in her institution, fermented soft porridge twice a week.

Discussion

Sources of knowledge on fermented foods

The data collected support the argument that knowledge on fermented food came from different sources including the parents, grandparents, the relatives but rarely by the health care workers. Food fermentation is a traditional method of food preparation which has been inherited culturally over the years.^{18,19} Thus, the young generation can inherit this indigenous knowledge through the older generation as discussed by some of the caregivers in this current study. However, healthcare workers have little knowledge and benefits of probiotics and fermented foods. For example, one Nigerian study reported 95% of clinicians not being familiar with probiotics but showed interest in learning more about them.²⁰ In one other study, only about 50% of medical students had acceptable knowledge of

probiotics.²¹ The previous findings indicated that promotion and knowledge of fermented foods is lacking in the medical training institutions. Thus, educating health care workers on fermented foods may promote the usage of these foods in the communities. Fermented foods and probiotics are now considered as "functional foods" as their nutrients and health benefits exceed the traditional nutritional value.²² Their additional benefits include normalization of intestinal flora, prevention of gut infestation by potential pathogenic bacteria, colon cancer prevention and treatment of diarrhea in both adults and children.^{23,24} This is the message that needs to be passed on to the South Africa communities.

Misconceptions about fermentation

Most caregivers had their own perception of how to ferment indigenous foods. They would give views which were not in line with known scientific process of fermentation at all, for example, the insertion of a stainless spoon in the ferment, in anticipation that it would speed up the fermentation. This observation most likely results from acculturation of the younger generation through the introduction of the western diets to replace the indigenous cuisines.¹⁷ In the urban areas, residents obtain their foods from the commercial sources like the supermarkets. These outlets rarely stock the indigenous foods. Since the home preparation of fermented foods is seldom practiced, knowledge on preparation of indigenous foods is lost. This was observed in this study when the participants gave their wrong perceptions of how to prepare fermented foods in their communities. Each country and community has its own recipe for the preparation of fermented foods, which has been documented or passed on by the word of mouth over the generations.^{1,4,25,26}

Feeding Practices

In this study it was observed that the caregivers were not comfortable to feed their children with fermented foods. This could be as a result of several reasons: Firstly, they have poor knowledge about the benefits of fermented foods especially in children. This

is a new generation that has grown up knowing mainly the western diets and has no knowledge about the value of indigenous foods.

Research findings available in literature show that fermented foods fight diarrheal diseases and increase the nutritional value of indigenous foods.^{4-6,27} However, this information is not available in the rural village communities. Thus, promotion of fermented food usage in feeding young children is highly recommended. Secondly, the health care workers reportedly educate them wrongly that fermented foods are unsuitable and may even harm the infants if they fed them the foods. This was evident from some of the participants in the focus group discussions in the study who mentioned that fermented foods like yoghurt could retain phlegm in the respiratory system of the young children. A similar perception was also reported in one study in Kenya as well.¹⁷

In contrary to the believes and perception gathered in this study, fermented foods and probiotics have been demonstrated to be safe for young children and infants.^{5,28} However, those interviewed on their use, cited lack of guidelines as one of the main barriers to the usage of probiotics.²⁹ One of the strategic approaches to promoting their usage would be to formulate the guidelines on the production technology, microbiology and biochemical properties of indigenous fermented foods.

Families in the rural communities in a number of African countries reportedly feed their young children with fermented foods.^{16,17,30} There was a positive response from these communities that usage of fermented foods to feed children was beneficial. In one of the studies done in Nigeria, the acceptability of using fermented foods for infant feeding is because the long term feeding habits within the community³⁰ and the caregivers were themselves fed on the same food in their childhood.

Limitations of the study

This study was done in a peri-urban community in Gauteng Province of South Africa. The findings may be different if the study was conducted in other settings, for example, in the deep rural areas of Gauteng province, or other rural areas of South Africa. It is, thus, recommended that studies be conducted in other areas of South Africa to corroborate the findings of this study.

Conclusion

Although the child caregivers knew what fermented foods were in this study, preparation and usage of these foods was seldom practiced. Healthcare workers need to be educated on the benefits of indigenous fermented foods for young children feeding. Health promotion of fermented foods is required in order to increase young children feeding with fermented foods.

Acknowledgements

We acknowledge the Flemish Interuniversity Council (VLIR) funding that assisted in the completion of this study.

Competing interests

There is no conflict of interest to declare.

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