

Full Length Research Paper

Exclusive breastfeeding: Mothers' awareness and healthcare providers' practices during antenatal visits in Mvomero, Tanzania

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In Tanzania, about 42% of children below five years are stunted due to chronic malnutrition. Exclusive breastfeeding (EBF) may be an effective strategy to protect infants from malnutrition. Therefore, it is important to disseminate accurate information on breastfeeding recommendations to pregnant women attending antenatal visits. The aim of the study was to assess the awareness of exclusive breastfeeding among first time pregnant women attending antenatal clinics and breastfeeding counselling practices of healthcare providers, for alignment with the World Health Organizations (WHO) recommendations. A cross sectional study of eighty first time pregnant women attending antenatal clinics at Mzumbe Health Centre and Tangeni dispensary, and six nurses providing care in these facilities was undertaken. Questionnaires were used to evaluate women's breastfeeding knowledge and future intentions to breastfeed and nurses' breastfeeding knowledge and counselling practices. Results indicated that women's knowledge in exclusive breastfeeding was generally poor; there were no differences in breastfeeding knowledge between the two facilities. About 94% of women had never received breastfeeding counselling at the antenatal clinics, 61% received breastfeeding information from their mothers, 37.5% said glucose water should be given immediately after delivery, only 23.8% planned to introduce solids at six months, the majority indicating that they would start solids at a younger age. Common reasons for introducing solids were; baby will be old enough (55%), baby will be hungry (32.5%), advised by the nurse (7.5%). Only one nurse had received training on breastfeeding, nurses' knowledge of WHO breastfeeding recommendations was poor; however nurses had satisfactory knowledge of how to solve breastfeeding problems. Only three nurses said they educate mothers about exclusive breastfeeding. In conclusion, findings highlight a need to focus on delivering information and education to women and nurses.

Key words: Breastfeeding, pregnant women, healthcare providers, knowledge, practices.

INTRODUCTION

The under-five child mortality rate is very high in Tanzania. In the period of 2006 to 2010, it was reported

to be 81 per 1,000 live births (National Bureau of Statistics (NBS) and ICF Macro, 2010). A major factor

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contributing to infant and child mortality is malnutrition. The current Tanzania Demographic and Health Survey (TDHS) reports that approximately 42% of children below five years are stunted as a result of chronic under nutrition (NBS and ICF Macro, 2010). Malnutrition of the foetus starts during intra-uterine life when the mother has inadequate food intake as a result of food insecurity, poor caring practices, lack of information on proper diet (Lartey, 2008), and unhealthy living environments (NBS and Opinion Research Corporation (ORC) Macro, 2005). Other factors which contribute to maternal malnutrition in sub-Saharan Africa include micronutrient deficiencies, high rates of HIV infection and malaria (United Nations Children's Fund (UNICEF), 2005). The situation becomes worse after delivery when the infant is not exclusively breastfed and due to early introduction of nutritionally-poor complementary foods. The Tanzania National Strategy for Growth and Reduction of Poverty Strategy paper of 2011 targets to increase the prevalence of exclusive breastfeeding from 50% (2010) to 60% by 2015 (International Monetary Fund, 2011). Increasing rates of exclusive breastfeeding is a global goal which is urgently required as an intervention for child survival (UNICEF, 2009).

Exclusive breastfeeding means giving infants only breast milk with no addition of other foods or drinks, including water (WHO/UNICEF, 2003). The WHO recommends an early initiation of breastfeeding of one hour after birth and exclusive breastfeeding for six months (WHO, 2001b; WHO/UNICEF, 2003). Exclusive breastfeeding for the first six months of life is estimated to lower infant death by 13% (Jones et al., 2003). Other dangers associated with not breastfeeding as recommended include high infant death rates caused by lowered protection against harmful bacteria and other gastrointestinal infections and slow recovery from illnesses (WHO, 2001b).

In Africa, the majority of mothers fail to practice exclusive breastfeeding as recommended (UNICEF, 2006b). There are cultural, social and economic barriers to exclusive breastfeeding including practices of pre-lacteal feeding, giving drinking water and herbal teas (Shirima et al., 2001). In Tanzania, studies report early introduction of non milk foods such as thin maize porridge and animal milk as early as a few weeks or months after birth (NBS and ICF Macro, 2010; Shirima et al., 2001). In some societies like the Yoruba of Nigeria, exclusive breastfeeding is regarded as threatening to the infant because they believe the infant needs drinking water to suppress thirst and accelerate faster growth (Davies-Adetuyogbo, 1997). Despite the well documented benefits of exclusive breastfeeding both to the mother and the baby (Kramer and Kakuma, 2002; WHO, 2002), and recommendations by the WHO (WHO, 2001b; WHO/UNICEF, 2003), only 50% of women in Tanzania breastfeed their infants exclusively for six months (NBS and ICF Macro, 2010).

Available evidence suggests that breastfeeding practices

may not meet the current recommendations for exclusive breastfeeding (Shirima, 2000, 2001; NBS and ICF Macro, 2010). Antenatal visits may provide a platform for healthcare providers to give information about the exclusive breastfeeding practices. The information and counselling provided by healthcare providers is usually taken to be the most influential because mothers see them as their role models in matters related to breastfeeding (Hillenbran and Larsen, 2002). Therefore so as to understand barriers and limitations to exclusive breastfeeding, the purpose of this study was to assess the awareness of exclusive breastfeeding among first time pregnant women attending antenatal clinics and to assess breastfeeding counselling practices of healthcare providers in comparison with the WHO recommendations. Knowledge of exclusive breastfeeding among pregnant women and healthcare providers was also assessed.

MATERIALS AND METHODS

A cross sectional study by using questionnaires to evaluate exclusive breastfeeding knowledge of mothers and health care providers and also to determine breastfeeding counselling practices of health care providers was conducted in Mvomero district in Morogoro region of East Central Tanzania. Mvomero is a rural district with a total population of 260,535. The study was conducted at antenatal care clinics of two health facilities in Mvomero district namely, Mzumbe Health Centre and Tangeni dispensary. This area was selected because it is within a new district formed from the existing Morogoro rural district a few years ago. Due to this fact, there are very few studies already done in the district, and breastfeeding in this group as a district unit of population has not been studied. The study was designed to include two kinds of respondents: First time pregnant women in their 16+ week of pregnancy attending antenatal clinics and a convenience sampling method was used where any woman available and meeting the inclusion criteria was interviewed to assess their knowledge of exclusive breastfeeding. Nurses providing care to pregnant women during antenatal visits were also included in the study. Data were collected between June to July, 2011.

All pregnant women attending antenatal clinics during the days of data collection were approached in the waiting area of the antenatal clinics. Those meeting the study criteria of being first time mothers and above 16 weeks pregnant were explained the purpose of the study verbally, and confidentiality of response was assured. Those willing to participate gave oral consent. Interviews were conducted privately after their clinic appointments. Also, health care providers providing antenatal care read information sheets gave written consent. A convenience sample of eighty pregnant women, forty from each health facility was interviewed. This target number for each health facility was pre-determined based on past attendance records.

Six out of eight nurses providing antenatal services in the two health facilities were included. Four of these were from Mzumbe health centre and two from Tangeni dispensary. These were chosen because in Tanzania, nurses are the main providers of antenatal and delivery care in all health facilities. These consist of nurses who have been trained at various levels of the health system for at least two to four years in maternal and child health aiding, nursing and midwifery care.

Two questionnaires were developed for collecting the data of the study. One questionnaire was developed to determine pregnant women's knowledge of breastfeeding and future intentions to

Table 1. Demographic characteristics of women (n = 80).

Characteristic	n (%)
Literacy level	
Not able to read and write	25 (31.2)
Can read and write to some extent	24 (30.0)
Can read and write	31 (38.8)
Education level	
No formal education	25 (31.2)
Standard 1-7	27 (33.8)
Secondary school	12 (15.0)
Above secondary school	16 (20)
Occupation	
Housewife	18 (22.5)
Casual worker	36 (45.0)
Formally employed	11 (13.8)
Self employed	15 (18.8)
Stage of pregnancy (weeks)	
16-20	18 (22.5)
21-25	11 (13.8)
26-30	25 (31.2)
Above 30	26 (32.5)
Started antenatal clinic (weeks)	
At 6-15	26 (32.5)
At 16-20	49 (61.2)
At 21-25	5 (6.2)

breastfeed. The questionnaire was pre-tested on six pregnant women attending MCH clinics at Mzumbe health centre to ensure that questions are worded clearly and changes were incorporated. Interviews were conducted after women's clinic appointments to assess their knowledge in areas of breastfeeding such as: Importance of colostrum and initiation of breastfeeding, duration of feeding, practical aspects of breastfeeding, effective feeding, advantages to the baby and the mother, breastfeeding problems and future intentions to breastfeed. The questionnaire also included socio-demographic characteristics of the group. The second self administered questionnaire was developed to determine the current practices and breastfeeding knowledge of nurses providing antenatal care.

Questions were formulated based on WHO breastfeeding recommendations, study instruments used in similar and previous research and published literature of studies on breastfeeding knowledge, attitudes and practices. In addition, nurses were asked to identify a correct picture indicating positioning and attachment of infants to the breast. This study was approved by the Massey University Human Ethics Committee and permission was granted by the Morogoro Regional Medical Office. Data were analysed using statistical package for social sciences (SPSS) package version 17 (SPSS Inc., Chicago, IL, USA). All variables were categorical and were described by using the frequencies and percentages.

RESULTS

Pregnant women

Demographic characteristics of participating women are presented in Table 1. Results indicated that although the majority of women (58.8%) knew that immediately after birth a baby should only be given breast milk, there was a high percentage of the mothers (37.5%) who believed that babies should be given glucose water and 3.8% who did not know what a baby should be given immediately after delivery. When asked about how soon a baby should be put to breast after delivery, 52.8% knew that it is within 1 h after delivery. The majority of the women (63.8%) said colostrum was important and among these, 33.8% said colostrum is important because it provides babies with protection against infection and illness. More than half of pregnant women (57.5%) knew that a baby should be breastfed on demand. Only 28.8% were aware that breast milk alone is sufficient for the baby for six months while 41.3% thought 4 to 5 months is the appropriate age to start solid foods. About 93.8% of the women were aware that breastfeeding should be continued up to two years. More than half of the women (52.5%) believed that it is right to give water to a baby after every breastfeed.

When asked when they intend to introduce solid foods, 35% said 4 months, 25% said 3 months, 23.8% said six months, 12.5% said 5 months, 2.5% said 2 months and 1.2% said they will introduce solids at less than 1 month. Reasons given for introducing solids at the mentioned age included; baby will be old enough to start solids (55%), baby will be hungry (32.5%), advised by the MCH nurse (7.5%), advised by relatives and friends (2.5%) and that's the age their mother introduced solids to them (2.5%).

Women's responses to questions of knowledge of advantages of breastfeeding both to the mother and the baby are presented in Table 2. The people most frequently mentioned to help with problems related to breastfeeding were other family members (33.8%), mother (31.2%), MCH nurse (27.5%), friends (6.2%) and husband or partner (1.2%). When asked about their future intentions to breastfeed, (93.8%) said 'yes'. Of those who intended to breastfeed, 66.2% intended to do so for 1 to 2 years, and 28.8% for 7 to 12 months. Those who did not intend to breastfeed (3.8%) claimed to have health problems that did not allow them to do so and 1.2% said their relatives never breastfed because they had no milk, so they assume the same will happen to them. Women gave different responses regarding breastfeeding in various circumstances. These are shown in Table 3. More than half of the women (65%) had received support and information regarding breastfeeding from various sources. Of these, 22.5% received this information from their mothers and 35% preferred other family members for support regarding breastfeeding.

Table 2. Frequency of women's responses to questions regarding advantages of breastfeeding to mother and baby and effective breastfeeding (n = 80).

Questions asked	*Agree [n (%)]	Neither agree nor disagree [n (%)]	*Disagree [n (%)]
Breastfeeding reduces the risk of lung infection among babies	23 (28.7)	47 (58.8)	10 (12.5)
Baby who received breastfeeding is less prone to get diarrhoea	68 (85)	10 (12.5)	2 (2.5)
Breast milk provides baby with more protection from allergy compared to formula milk	53 (66.2)	26 (32.5)	1 (1.2)
Breastfeeding causes good development of baby's teeth and gum	36 (45)	39 (48.5)	5 (6.2)
Breastfeeding is beneficial for the mother	68 (85)	12 (15)	0 (0)
Exclusive breastfeeding is beneficial in spacing birth	64 (80)	16 (20)	0 (0)
Breastfeeding helps to stimulate uterine contraction	7 (8.8)	58 (72.5)	15 (18.8)
Mothers who practiced breastfeeding may achieve pre-pregnancy weight faster	20 (25)	58 (72.5)	2 (2.5)
Mother who practiced breastfeeding is less likely to experience breast problems	38 (47.4)	15 (18.8)	27 (33.8)
Babies will gain weight if they receive effective breastfeeding	78 (97.5)	2 (2.5)	0 (0)
Correct positioning helps to achieve effective breastfeeding	41 (51.2)	38 (47.5)	1 (1.2)
Babies sleep well after they receive adequate breastfeeding	78 (97.5)	2 (2.5)	0 (0)

*Strongly agree' and 'agree' were combined, and 'strongly disagree' and 'disagree' were combined.

Spearman's rank order correlation was run between level of literacy, highest level of education attained, occupation and monthly family income and various variables of breastfeeding knowledge. The correlation analysis revealed various positive and inverse significant correlations between demographics and knowledge variables. For example, the level of literacy was found to be positively correlated with the variable 'how often a baby should be breastfed' (R = 0.517; P < 0.01). Therefore, knowing how to read and write increased a woman's knowledge of breastfeeding on demand. Highest level of education attained was significantly correlated with the variable 'when mothers intend to introduce solid foods' (R = 0.418; P < 0.01). This means that women with higher education of at least secondary school intended to introduce solid foods at a right age of six months. Occupation was positively correlated with 'giving water is encouraged after every breastfeeding' (R = 0.621;

P = 0.039). That is, women who were employed were more likely to continue breastfeeding for longer duration than unemployed women. Monthly family income was inversely correlated with 'how soon should a baby be put on the breast after delivery' (R = -0.535; P = 0.025). Therefore, women with higher family monthly income were more knowledgeable in this variable compared to those with lower income.

Nurses

Six nurses participated in this study. All nurses were female and had breastfed children of their own. The majority were public health nurses (66.7%), the remaining were nursing officers and maternal and child health aides. Half of them had reached Diploma level as their highest education level. When asked about sources of their breastfeeding knowledge, two nurses said it was

from feeding their own children, two said clinical experience and the remaining two mentioned personal reading. The nurses indicated a deficit in breastfeeding training, for example only one nurse had undergone training in matters related to breastfeeding, and the rest had never undergone any training regarding breastfeeding. Regarding breastfeeding recommendations, all six nurses were aware of the recommendations on exclusive breastfeeding for six months and the use of bottles, teats and pacifiers.

Only 3 nurses knew the recommendation for demanded breastfeeding. When asked if they educate mothers about these breastfeeding recommendations, only 2 nurses said 'yes'. When asked if they discuss importance of colostrum with pregnant women all nurses said 'no'. Nurses indicated high knowledge on breastfeeding during certain circumstances that may affect breastfeeding. For example when asked whether breastfeeding should continue during maternal

Table 3. Responses given by women on questions about breastfeeding in certain circumstances (n = 80).

Question	Response	n (%)
In your opinion, should breastfeeding continue during:	Yes	29 (36.3)
	No	31 (38.8)
	Does not know	20 (25)
Pregnancy	Yes	62 (77.5)
	No	10 (12.5)
	Does not know	8 (10)
Maternal sickness	Yes	80 (100)
	Yes	80 (100)
Child sickness	Yes	29 (36.3)
	No	29 (36.3)
	Does not know	22 (27.5)
Menstruation	Yes	27 (33.8)
	No	40 (50)
	Does not know	13 (16.3)
Mother on medication	Yes	36 (45)
	No	26 (32.5)
	Does not know	18 (22.5)
HIV infected	Yes	36 (45)
	No	26 (32.5)
	Does not know	18 (22.5)
Alcohol drinking	Yes	36 (45)
	No	26 (32.5)
	Does not know	18 (22.5)

and maternal and child illness and menstruation, all of them said 'yes'. However, nurses did not have enough knowledge on other breastfeeding scenarios; for example when asked if breastfeeding should continue when the mother is on medication and during alcohol drinking only one nurse said 'yes'. Regarding if women should continue breastfeeding during pregnancy, 5 nurses said 'yes', when a mother is human immunodeficiency virus (HIV) infected, 2 nurses said she should continue breastfeeding, 2 nurses said she should not continue to breastfeed and the remaining 2 did not know whether an HIV positive mother should breastfeed or not.

All the nurses agreed that breast milk is the ideal food for the baby. Participants indicated different levels of knowledge when asked whether mixing breastfeeding with formula feeding reduces breast milk supply, 2 agreed, 2 were neutral and 2 disagreed with this statement. All the 6 nurses agreed that counselling by healthcare providers is effective in encouraging more women to breastfeed and were aware that a baby should be put to the breast within the first hour after delivery. When asked if they counsel pregnant women about exclusive breastfeeding, 3 nurses said 'yes' and that they do it 'sometimes'.

Regarding options that may help to resolve sore nipples, all the nurses said that seeking expert assistance with positioning and attachment helps resolve sore nipples while 2 nurses thought to stop feeding on the affected side will help resolve problem of sore nipples and 2 said advising mothers to apply breast milk to nipples will help resolve sore nipples. None of the nurses suggested checking symptoms of nipple thrush or advising mothers to apply lanolin to help resolve sore nipples. When asked about symptoms that could indicate poor attachment to the breast, nurses suggested the following; baby feeding unsettled (4), sore and cracked nipples (5), repeated engorgement (5) and mastitis (3).

On the side of the options to help resolve the problem of breast milk insufficiency, all nurses mentioned increasing frequency of breastfeeding and seeking expert assistance with positioning and attachment. One nurse mentioned advising mothers to drink more fluid will help to resolve breast milk insufficiency. Regarding the advice to be given to women with mastitis, 3 nurses said it is better to continue breastfeeding when a woman has mastitis, 3 nurses also said that women with mastitis should stop feeding on the affected side while 2 nurses said women with mastitis should stop feeding altogether.

DISCUSSION

Previous studies in Tanzania reported high prevalence of pre-lacteal feeding and discarding of colostrum (Shirima et al., 2000, 2001; Nkala and Msuya, 2011). However, this study indicates most mothers knew that babies should receive the first milk. There appeared to be different views about the health benefits of colostrum for an infant. About 64% of respondents said that colostrum is important and they knew that colostrum and breast milk was the best food and that only colostrum should be given to the baby immediately after a safe delivery. This positive result could be explained by the positive breastfeeding culture of the Tanzanian women.

Early initiation of breastfeeding is important for the health of the infant and successful establishment and maintenance of breastfeeding (Mikiel-Kostyra et al., 2002). Shirima et al. (2001) reported 84% of rural mothers and 93% of urban mothers in Tanzania initiated breastfeeding within six hours after delivery which reflected their knowledge of the importance of early initiation of breastfeeding. A delay in the onset of breastfeeding has been reported to have an increased risk of neonatal mortality (Edmond et al., 2006).

In the current study, 52.8% of mothers were aware of the need to initiate breastfeeding within 1 h of birth. The difference between results of the current study and those of Shirima et al. (2001) could be due to the women in that study being informed either during the antenatal or postnatal period on the benefits of early initiation. In this study, participants had three misconceptions about why

babies should not be put to the breast within the first hour. These incorrect ideas could be influenced by tradition and cultural values of this semi-rural population. In order to solve this problem of such misconceptions, educating the public on the current breastfeeding recommendations, particularly through breastfeeding campaigns, which not only target the mother but the general community and social networks may be useful. This result also supports the need for breastfeeding education during the antenatal period.

Duration of breastfeeding

More than half of the women had the perception that it is good to give water to a baby after every breastfeeding. Shirima et al. (2001) also reported high prevalence of water supplementation in rural and urban areas of Morogoro region. Only 28.8% of pregnant women interviewed were aware that babies less than six months of age should not be given water or anything else to eat or drink, and that breast milk alone is sufficient for the infant until six months of age. The WHO recommends no water supplementation in exclusively breastfed babies (WHO, 2001b). This is because breast milk contains enough average daily fluid requirements for healthy infants which are in the range of 80 to 100 ml/kg in the first week of life to 140 to 160 ml/kg between 3 to 6 months of life (Pan American Health Organization (PAHO)/WHO, 2003), if breastfed exclusively and on demand. The content of breast milk is 88% water and it contains very low amounts of solutes, therefore there is no need of water to flush out the excess solutes (PAHO/WHO, 2003). The WHO recommends continuation of breastfeeding for up to two years and beyond (WHO/UNICEF, 2003). In the current study, women were well aware of the age to stop breastfeeding altogether. About 94% of pregnant women believed that breastfeeding should continue until the child is two years of age. This is a very encouraging result which may mean a long duration of breastfeeding as recommended in this population.

The findings of this study showed that more than half of women knew that babies should be breastfed on demand. Both Shirima et al. (2000 and 2001) reported results which are similar to those of the current study that breastfeeding on demand was highly practised in both rural and urban areas of Morogoro region. This practice is in line with the WHO recommendations which emphasize demand feeding (WHO/UNICEF, 2003).

Introduction of solids

Negative effects of early introduction of solid foods continue to be an important concern for the health of the Tanzanian infants. In this study, only 31.3% of women

thought six months was the appropriate age to start giving solid foods. The results from this study are in line with findings from the TDHS (NBS and ICF Macro, 2010), which identified that most babies in Tanzania are not exclusively breastfed for the first six months of life. The lack of knowledge about the recommended age for introduction of solid food among the first time mothers in our sample is probably the major contribution to the large number of women who intended to introduce solid foods at less than six months. Similar results were reported by Shirima et al. (2000) that introduction of solid foods in rural areas was done at a median age of 2 months and 2.5 months in urban areas of Morogoro. This study indicates that the majority of women intend early initiation and long duration of breastfeeding, but very few intend to breastfeed exclusively. Therefore, as an essential target, future interventions in Tanzania must target exclusivity, beginning in the antenatal period.

Future intentions to breastfeed

In Tanzania, breastfeeding rates are very high at 94% (NBS and ORC Macro, 2005). This was also reflected in this study where the proportion of pregnant women who intended to breastfeed their babies was high at 93.8%. Although the participants were pregnant women who had not started breastfeeding, their early decision would bring a positive outcome after childbirth. These results are similar to those of a study by Hoyer and Pokorn (1998), which showed that the time of decision to breastfeed was important to determine the duration of breastfeeding and that the intention to breastfeed was a good indicator of the actual initiation and duration of breastfeeding. In that study, 77.3% of pregnant women intended to breastfeed. This early choice of women allowed them to have better intellectual and physical preparation. Therefore, targeting education in the antenatal period may be a crucial strategy to increase rates of exclusive breastfeeding.

Although participants in our study viewed breastfeeding as the best nutrition for infants, the majority did not support exclusive breastfeeding, but rather, supplementation of breast milk with water and home-made foods. Only 28.8% of mothers were aware that breast milk is sufficient for the baby for the first six months without addition of any other food or drink. A study by Davies-Adetugbo (1997) reported similar findings after assessing the knowledge and attitudes of breastfeeding in poor, rural communities of Nigeria. Mothers in that study mentioned breastfeeding as the best nutrition for their babies, on the other hand, they did not practice exclusive breastfeeding but rather, supplemented breast milk with other fluids and formula. Similar practices were reported by Shirima et al. (2001) in Tanzania that early introduction of thin porridge was common among mothers in Morogoro region. These practices can lead to reduced breast milk production, early cessation of breastfeeding and bottle feeding (Hill et al., 1997).

Advantages of breastfeeding to mother and baby

Mothers in this study did not fully understand all the health benefits of breastfeeding, both to the infant and the mother, suggesting a need to emphasize this information in antenatal breastfeeding education in the population studied. Although the majority of the pregnant women knew that breast milk provided the best nutrition for the baby as seen in the results, they were not aware of other benefits such as breastfeeding reduces the risk of lung infection among babies, breastfeeding causes good development of baby's teeth and gum, and that a mother who practiced breastfeeding is less likely to experience breast problems. These gaps in women's knowledge provide an important opportunity to further promote breastfeeding. Shirima et al. (2000) reported that the advantages of breastfeeding mentioned by mothers were only those related to the infant and none to the mother. This reflects another area for stressing breastfeeding education and information to pregnant women. However, majority of women were aware of some advantages as they strongly agreed that babies sleep well after they receive adequate breastfeeding and that babies will gain weight if they receive effective breastfeeding.

Sources of breastfeeding information and support

More than half (65%) of pregnant women mentioned receiving breastfeeding information from sources other than the MCH nurses. Although health care providers' advice is not the only expected source of information, it is interesting to note that a higher number of the respondents received breastfeeding information from other sources such as their mothers (largest proportion), grandmothers, friends and relatives rather than the physician and the media. This result may be explained by the Tanzania culture that pregnant women are usually supported and taken care of by their mothers, grandmothers or other female relatives, and the way they practice breastfeeding is usually due to the information they receive from such people. Contrary to this finding, a study done in Uganda among antenatal and postnatal women reported health facilities as the major source of breastfeeding information (Petit, 2008). This could be because participants in that study included mothers who had already given birth, who might have been informed about breastfeeding before and after discharge from the hospital.

The effect of receiving information from people other than healthcare providers was reported by Shirima et al. (2001) who identified that mothers who received breastfeeding information from traditional birth attendants or someone other than healthcare providers reported a shorter duration of exclusive breastfeeding. The fact that more respondents received information about breastfeeding from the family and almost none from other

sources provides an important basis for targeting future interventions, as education and communication activities on exclusive breastfeeding in Tanzania are only targeting mothers, usually in their antenatal visits during pregnancy or for child health care. Therefore, it would be important that the Tanzanian national strategy on the promotion, protection, and support of breastfeeding contain a component of information, education, and communication activities aimed at these influential family members to improve their knowledge of the need for exclusive breastfeeding in infants up to six months.

Breastfeeding in certain circumstances

There are certain circumstances that may affect breastfeeding and reduce the rates of early initiation, exclusivity and duration of breastfeeding. The women in this study were asked about some certain circumstances which may affect breastfeeding. The respondents in this study were generally quite knowledgeable about breastfeeding in these circumstances, such as whether breastfeeding should continue during maternal illness, child illness and during menstruation. These were encouraging findings among these first time mothers to be. However, the majority of women did not know whether breastfeeding should continue during alcohol drinking, pregnancy, HIV infection and when the mother is on medication. Similar to these results, Shirima et al. (2001) reported that 84% of mothers from rural areas and 61% from urban areas of Morogoro believed that a woman should stop breastfeeding as soon as she becomes pregnant. This could be due to cultural beliefs surrounding breastfeeding in these populations. Breastfeeding campaigns and education programmes should be more focused on the special conditions where breastfeeding should or should not continue.

To date there have been many studies conducted regarding mothers' knowledge of breastfeeding but they did not tackle women's knowledge of alcohol during breastfeeding. However, Jones et al. (2011) found that both midwives and pregnant women were comfortable to discuss the topic but they were not knowledgeable regarding the recommendations and risks associated with alcohol drinking during pregnancy and breastfeeding. Generally, little is known regarding how women perceive and understand the issue of alcohol consumption while breastfeeding in Tanzania. In the current study, 45% of the respondents were aware that breastfeeding should continue during alcohol drinking. When a breastfeeding mother consumes alcohol, a small amount of alcohol passes freely into her breast milk and passes freely out of breast milk after approximately two hours after alcohol consumption for women of average weight. It is therefore more desirable to breastfeed the infant when no alcohol is remaining in breast milk and blood (WHO, 2001b). However, the WHO recommends avoiding alcohol or at

least restricting alcohol consumption (drink occasionally) during lactation (WHO, 2001b).

All six nurses involved in the study indicated that they have never demonstrated correct positioning and attachment of the baby to the breast to women during antenatal visits. Also, only 2 nurses were able to identify a correct picture demonstrating correct positioning of the baby to the breast. This result was contrary to that of a recent study carried out in South Africa to assess knowledge and practices of nursing staff regarding the Baby Friendly Hospital Initiative (BFHI). That study found out that 89% of nurses involved in the study were able to demonstrate the correct positioning of the baby to the breast (Daniels and Jackson, 2011). This difference could be caused by the nurses in the latter study having received training on breastfeeding and infant feeding issues during their time in service to update their knowledge.

However, the results of the current study were similar to a study carried out in Nigeria to assess the knowledge, attitude and practices of health workers in local government facilities regarding BFHI. That study which also involved nurses without prior breastfeeding training indicated that only 5.2% of the nurses were able to demonstrate the correct positioning and attachment of the baby to the breast (Okolo and Ogbonna, 2002). A study which used ultra sound to indicate the way a baby removes milk from the breast indicated that correct positioning and attachment of the baby at the breast is vitally important for the effective transfer of milk and may be the most important measure to prevent a number of breastfeeding problems (Woolridge, 1986). Therefore it is important for healthcare providers providing antenatal care to know this and correctly demonstrate it to the women in order to make those who would otherwise not breastfeed due to breast problems caused by improper attachment breastfeed successfully.

Healthcare providers have been believed to be in the appropriate place to promote and support breastfeeding; even so, unavailability of practical instruction and direction of proper breastfeeding technique may have effects on the positive results of breastfeeding, thus training is greatly needed (Leavitt et al., 2009). By gaining suitable knowledge and skills, healthcare providers can help increase the rate of exclusive breastfeeding and the duration of breastfeeding. Staff training together with refresher courses on breastfeeding recommendations should be introduced to all health facilities to enable nurses providing antenatal care to obtain necessary skills and knowledge. The preparation and distribution of pamphlets and posters that contain major breastfeeding recommendations could be taken into consideration.

Three nurses said that they would recommend breastfeeding until four months, contradicting the WHO recommendations which require infants to be exclusively breastfed up to six months (WHO/UNICEF, 2003). This could be due to not receiving any training on breastfeeding. These nurses did not know the recommended age for

introduction of solid foods. They suggested introducing solid food before six months. Evidence shows that infants who were exclusively breastfed for six months suffered less from gastrointestinal infections and experienced no growth deficits compared to infants who were exclusively breastfed for less than six months (Kramer and Kakuma, 2002).

All nurses knew the recommendation against the use of pacifiers. Step 9 of the ten steps to successful breastfeeding recommends no use of bottles, teats or pacifiers to enable mothers to establish and sustain breastfeeding (WHO/UNICEF, 1989). This could be because the use of pacifier is not a common practice in Tanzania.

Although only three nurses said they train mothers about breastfeeding recommendations, all the six nurses recognised that counseling by healthcare providers is effective in encouraging more women to breastfeed. This reflects nurses' personal choice to breastfeed their own children. Other studies also reported the majority of nurses do not train women about breastfeeding but they do recognize the need for practical and emotional support (Ebersold et al., 2007; Sheehan et al., 2009). The current study found out that only three nurses reported to be counselling pregnant women about breastfeeding and only in response to being asked. Aspects of breastfeeding which were reported to be discussed included the importance of colostrum, effective feeding and advantages of breastfeeding to the baby. These results were consistent with those of other studies that reported that a number of healthcare providers did not have enough breastfeeding knowledge and they were not prepared to give proper breastfeeding counseling to mothers (Amir and Ingram, 2008; Izatt, 1997). Even though these results were expected, they have drawn attention to the need to reinforce the advantages and importance of breastfeeding among healthcare providers.

Breastfeeding problems

Nurses in this study responded well to the question which asked them to state signs of poor attachment of the baby to the breast. Among the reasons that were mentioned by most of the nurses were: baby feeding unsettled, sore and cracked nipples, repeated engorgement and mastitis. With regard to management of breastfeeding for women with mastitis, three nurses said that women with mastitis should stop feeding on the affected side while two nurses said women with mastitis should stop feeding altogether. This indicated poor knowledge of mastitis management among nurse participants. Even though these nurses are not the ones to look after mothers when they have given birth, this result is a cause for concern. For the appropriate management of mastitis, it is advised that breastfeeding mothers should not give the breast a rest; instead they should continue breastfeeding on demand so that the milk is removed from the breast (Savage-King, 1998).

Breastfeeding education

The major sources of breastfeeding knowledge reported by nurses were gained from clinical experience, breastfeeding their own children and personal reading. The reason for this could be because there is no internal, routine training of healthcare providers in health facilities. A study carried out in Australia showed similar findings where doctors reported personal experience as their major source of breastfeeding knowledge (Brodribb et al., 2009). The nurses indicated lack of formal training, only one nurse had undergone training in breastfeeding, and the rest had never undergone formal training on breastfeeding after graduation. Initial training could be a good source of breastfeeding information to the nurses. This result is contrary to the requirement of the BFHI. Both facilities involved in this study are declared 'baby friendly'. The BFHI policy requires breastfeeding education courses to be provided for all nurses and other healthcare providers. Healthcare providers can be at risk of being a negative influence, especially when they give women incorrect, unsatisfactory and contradictory breastfeeding information and recommendations (Nelson, 2006). The lack of on-going training for nurses dealing with pregnant women indicated a gap which requires to be looked at by the health facilities. The findings of this study were similar to a previous study that healthcare providers and nurses were not knowledgeable enough to provide breastfeeding counselling to women (Freed et al., 1995).

In other countries, provision of education and training regarding breastfeeding in the form of programs was reported to be successful to improve the knowledge and practices of healthcare providers and to promote breastfeeding (Kronborg et al., 2008). This study supports the need for healthcare providers to acquire more knowledge regarding breastfeeding and to improve their education in order to be able to encourage exclusive breastfeeding for women during pregnancy. Educating women on breastfeeding during pregnancy helps to prepare them mentally to do so and has been shown to increase rates of exclusive breastfeeding (Su et al., 2007).

The findings of this study indicated inadequate knowledge and breastfeeding practices among the nurses despite the fact that the health facilities are supposed to be 'baby friendly'. This is a major obstacle to recommended breastfeeding practices. It indicates the need for baby friendly hospital initiative training for the nurses of these health facilities to respond to the concern and growing need for recommended breastfeeding practices.

Conclusion

There were many areas in which breastfeeding knowledge was incomplete, and nurses and the women were not fully aware of the WHO breastfeeding recommendations.

Also it was observed that there was a high frequency of antenatal attendance, but nearly all these attendees had not received information and counselling regarding breastfeeding which may have contributed to mothers' lack of knowledge.

The study has observed that even though a small number of women would initiate breastfeeding within 1 h after delivery, the majority intended to breastfeed for up to 1 to 2 years thus long duration of breastfeeding. However, it is observed that exclusive breastfeeding for six months would be rare as the majority of women intended to introduce solid foods before six months. The major sources of information on breastfeeding for pregnant women were mothers, grandmothers and mothers-in-law which may explain the perceptions of pregnant women which are not in agreement with the current breastfeeding recommendations.

Although nurses were knowledgeable in some aspects of breastfeeding, they appeared not to be ready to educate and counsel women. Also, nurses' knowledge deficits have been identified in some important areas of breastfeeding such as the duration of exclusive breastfeeding, correct attachment and positioning of the infant to the breast and breastfeeding in special situations. These deficits can negatively affect the quality of information provided to pregnant women during antenatal visits.

Accurate breastfeeding counselling and advice by healthcare providers with emphasis on the current breastfeeding recommendations can improve the breastfeeding knowledge of first time pregnant women thus increase rates of exclusive breastfeeding which in turn may reduce infant morbidity and mortality rates.

Potentially, the findings of this study indicate various important policy implications for breastfeeding interventions. Strategies to encourage mothers to follow breastfeeding recommendations should concentrate on improving their knowledge and understanding of the recommendations and must target exclusivity, beginning in the antenatal period. Also, efficient on-going training about breastfeeding knowledge and skills for all healthcare providers providing antenatal and postnatal care is recommended.

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