Exclusive breastfeeding knowledge and practices among health care workers in Northern Tanzania.

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Abstract

Background: Exclusive breastfeeding (EBF) practice is one of the interventions improving child survival. Health workers have been shown to be vital in influencing EBF practices.

Objectives: To assess the level of knowledge and supportive practices on EBF among healthcare workers Kilimanjaro region, northern Tanzania.

Methods: A cross sectional study was conducted between April - June 2011 health care providers working in 36 randomly selected health facilities of Hai and Siha districts. A questionnaire was used to obtain information. Observation of health worker-client interaction was conducted using a check list.

Results: A total of 250 health workers participated in this study. The majority (80 %) had adequate knowledge of EBF. However, 36 % of providers believed light porridge should be introduced after 4 months and 43 % believed infants will feel thirsty on breast- milk alone. Only 7 % of providers answered correctly on skills of support, positioning and attachment. Fifty percent of the facilities with labour/maternity wards gave breastfeeding lessons to post delivery women. The majority (90 %) gave theoretical information, without practical demonstration with positioning and/or attachment of the baby to the breast.

Conclusion: Providers had adequate theoretical knowledge of EBF but lacked important skills to support women in breastfeeding practices. Few labor/maternity facilities used the opportunity to educate women on EBF. Pre- and in-service health providers' training on breastfeeding should target improved practical skills.

Background

Exclusive breastfeeding (EBF) is not optimally implemented world-wide. Estimates indicate that 42% of infants are exclusively breastfed globally (1). In Sub –Saharan Africa (SSA), the setting with highest prevalence of infant and child mortality, suboptimal breastfeeding practices are common (2). Only 36% of SSA infants are exclusively breastfed (3). In Tanzania, the Demographic Health Survey indicates that only 59% of infants are exclusively breastfed (4). It has been estimated that exclusive breastfeeding for the first six months could reduce more than 800,000 infant mortality (5). Exclusively breastfed children are at lower risk of infection from diarrhoea and acute respiratory infection (ARI) than infants who are mix fed in the first six months of life (5–7). Diarrhoea and ARI are the two major causes of child mortality in low and middle income countries, contributing 33% of the 6.9 million deaths occurring each year globally (5). Exclusive breastfeeding (EBF) has also been shown to reduce mother-to-child HIV transmission compared to mixed feeding, an important preventive aspect in high HIV prevalence countries (8). Studies have shown health workers influence the exclusive breastfeeding practice. Health workers are highly respected in SSA, and women take their advice seriously (9, 10). They have an opportunity to educate mothers on breastfeeding and provide necessary support at antenatal, delivery and post-natal periods. In fact most SSA countries including Tanzania use the opportunity of high antenatal attendance to improve EBF

practices and have policies that require health providers to offer education, counselling and support on breast feeding in general and on EBF to pregnant and lactating mothers(11, 12). Results of several studies showed that more than 70% of lactating women reported to have received information on breastfeeding from health providers (9, 13–15). Findings from India, Ghana, and Tanzania showed that children of mothers assisted at delivery by health professionals or mothers who delivered in health facilities were more likely to initiate breastfeeding within one hour after birth, less likely to be given pre-lacteal foods and were still EBF at 3 months (4, 11, 15–17). Counselling on EBF in the immediate postnatal period, rooming in, prohibition of formula milk and pacifiers in the wards as well as having strong Baby Friendly Hospital Initiative (BFHI) policies were all associated with a 2–7 fold increase in median duration of EBF and overall EBF prevalence at 3–4 months post-delivery (18–20). Health care providers can support and promote correct breastfeeding and EBF practices when they have correct knowledge, attitudes and skills on breastfeeding (21). However there is a dearth of information about health care providers' knowledge of EBF and supportive practices. In Tanzania no published information exists on health workers knowledge and skills on EBF. This study aimed to describe the knowledge, attitude and supportive practice on exclusive breastfeeding among health care providers in two districts at Northern Tanzania.

Methods

Study design and site

A cross sectional study was conducted between April - June 2011 in Hai and Siha districts of

Kilimanjaro Region, Northern Tanzania. Hai and Siha districts are among the 7 districts of

Kilimanjaro Region. Hai district had a projected population of about 197,000 by June 2010, based on 2002 national census. Hai district has a total of 57 health facilities where 46 are providing Reproductive and Child Health (RCH) services. These include; 2 hospitals, 6 health centres and 38 dispensaries both government/public and voluntary agencies. Siha district had projected population of about 120,000 with total of 22 health facilities, 8 owned by the government and 14 privately owned. Of the 22 health facilities of Siha district, 15 provide RCH services. A total of 36 of 61 facilities with RCH services in the 2 districts were randomly selected and included in the study (24 facilities from Hai district and 12 from Siha district).

Study population, sample size and sampling

The study population included health care workers (HCWs) from selected health facilities both government and private, providing RCH services in Hai and Siha districts. HCWs included nurses and clinicians providing services to mothers and children i.e. those working in maternity ward or labour ward, working in RCH clinics, and in paediatric wards. We excluded health workers that did not consent for participation, were administrators not supervising RCH services and on leave during the study.

Sample size was calculated using Epicalc 2000. The prevalence of knowledge of breastfeeding among health care providers of 19.2% was used (from a study conducted in Nigeria by Okolo and Ogbonna, in 2002), alpha error level was set at 5%, power of 80% and addition of 5% for non-response. Substituting the values, a minimum sample size of 250 was obtained.

A multistage sampling technique was used. The first stage involved selection of health facilities. The health facilities were selected to reflect all levels of health care provision in the district including hospitals, health centres and dispensaries both government and private. All hospitals (N = 3) were included in the study, while simple random sampling was used to select seven of nine health centres and 26 of 49 dispensaries. The second stage was selection of healthcare workers reflecting the proportion of HCWs at different levels. Proportionate sampling was used with 38% (95) of participants from hospitals, 27% (68) from health centres and 35% (87) from dispensaries, giving a total sample of 250 health care providers. Simple random sampling was then used to select providers at respective health facilities.

Data Collection

A questionnaire consisting of both closed and open-ended questions was used to collect information from HCWs providing RCH services. A checklist was used to assess if breastfeeding education is given to pregnant and post-partum women, and if nurses demonstrate skills to women in post-natal wards in initiating and maintaining breastfeeding.

Instruments and Measurements

The questionnaire included socio-demographic characteristics of the HCWs (age in years, sex, marital status, education, cadre (nurse or clinician), years of experience, in-service training on breastfeeding, and district of work and facility ownership). Other variables measured were knowledge, attitudes and supportive practices on EBF. The questionnaires were self-administered and made available in Kiswahili (the local language). The questionnaire was pretested in health facilities not included in the study to ensure clarity of interpretation and ease of completion.

A standardized checklist was used for observation of supportive practices on exclusive breastfeeding by health care providers in ten health facilities including the three hospitals, four health centres and three dispensaries with RCH and delivery services.

Knowledge on exclusive breastfeeding

Seven questions covering four themes were used to summarize the level of knowledge.

The themes were; knowledge of the WHO definition of EBF (had four items: knowledge on WHO definition and duration on EBF, knowledge on breastfeeding initiation (had three items: when to start initiation of breastfeeding, importance for breastfeeding initiation and colostrum giving), knowledge of frequency of breastfeeding (one item: demand feeding) and knowledge on benefits of exclusive breastfeeding (two items: for the mother and child). Correct knowledge of any of the item was given a score of one; giving a

minimum score of 0 and a maximum score of 4. Those who scored 3 or above were graded as having sufficient knowledge on EBF and those scored below 3 were categorized as having poor knowledge.

Attitude towards exclusive breastfeeding

Likert type scales (ranging from 1–4) were used for attitudinal questions to allow for varying degrees of agreement or disagreement. A score of 4 implied strong agreement, 3 implied agreement, 2 implied disagreement and a score of 1 implied strong disagreement with positively framed attitude statements whereas; scoring were reversed for a negatively framed attitude statement. A score of 4 implied strong disagreement and a score of 1 implied strong agreement. There were 7 attitude questions with maximum score of 28 and minimum score of seven. All questions were given equal weight. Those scoring 17 and above were categorized as having positive attitudes towards EBF.

Skills and supportive practices on EBF

Skills/practice was measured by 3 questions with the aim of categorizing those with good practice and those with poor practice. Overall score on supportive practice for EBF was calculated based on 4 points of advice for positioning, 4 points on advice for attachment, and

4 points on advice to facilitate breast milk flow. The maximum score was 12 and a provider who scored 7 or more was considered to have “good supportive practice for EBF” and score below 7 to have “poor supportive practice on EBF”.

Data Analysis

Data was cleaned, checked for consistency and open-ended questions categorized and coded before analysis. Data was analysed using computer software SPSS version 16.0. Descriptive statistics were used to summarize data, proportion for categorical variables and mean or median with their respective measures of dispersion for continuous variables. Difference between groups was analysed by using Chi squire test for categorical data.

Results

Socio demographic characteristics of study participants

A total of 250 health care workers participated in the study. The median age of participants was 44 years (range 22–60 years). Majority of the participants were; females (76%), nurses (67%), had 11 or more years of work experience (69%) and had attended in-service training on breastfeeding & EBF in past 5 years (66%), Table 1. Of the 167 nurses the majority were nurse midwives 121 (72%), the rest were nurse officers, while among 83 clinicians the majority were clinical officers 62 (75%), followed by assistant medical officers 18 (22%) and the rest were medical officers.

Table 1
Socio-demographic characteristics of the participants (N = 250)

Variables	**n (%)**
Sex:	
Male	58 (23.3)
Female	192 (76.8)
Age (years):	
18–34	59 (23.6)
35–44	69 (27.6)
45 +	122 (48.8)
Median (IQR), years	*44 (36–52)*
Marital status:	
Never married	49 (19.6)
Ever married	201 (80.4)
Education:	
Certificate/ Diploma	228 (91.2)
Advanced diploma/Degree	22 (8.8)
Designation:	
Nurse	167 (66.8)
Clinician	83 (33.2)
Years of experience:	
≤10	78 (31.2)
11 +	172 (68.8)
Median (IQR), years	19 (10–27)
Had attended in-service training in breast feeding within past 5 years:	
Yes	165 (66.0)
No	85 (34.0)
Type of health facility:	
Dispensary	87 (34.8)
Health centre	68 (27.2)

Variables	n (%)
Hospital	95 (38.0)
Ownership of health facility:	
Government	174 (69.6)
Private	76 (30.4)
Department:	
Maternity	65 (26.0)
RCH clinic	118 (47.2)
Paediatrics	38 (15.2)
Others	29 (11.6)

Knowledge Of And Sources Of Ebf Information

The majority (97.6%) of respondents were aware of exclusive breastfeeding (EBF), the main source of information being training 74.4% (N = 186), and from colleagues 51% (N = 128), Fig. 1.

Nine out of ten HCWs knew correct the time to initiate breastfeeding and benefits of EBF, Table 2. Two thirds 166 (66.4%) of healthcare providers had sufficient knowledge of the WHO definition and duration of breastfeeding. Overall, 201 (80.4%) health workers were found to have good knowledge on exclusive breastfeeding. In- service training on EBF was the only predictor associated with good knowledge of EBF among the HCWs [adjusted odds ratio (AOR) 2.07; 95% CI 1.09–3.95].

Table 2
Knowledge on exclusive breastfeeding among health care providers in Kilimanjaro region, Tanzania (N = 250)

Items	Level of knowledge n (%)	
	Good	Poor
1.Knowledge on WHO definition and duration	166 (66.4)	84 (33.6)
2.Knowledge on time to start breastfeeding (with in 1 hour)	230 (92.0)	20 (8.0)
3.Knowledge on breastfeeding frequency (on demand)	188 (75.2)	62 (24.8)
4.Knowledge on benefits of exclusive breastfeeding	227 (90.8)	23 (9.2)
Overall exclusive breastfeeding knowledge among healthcare providers	**201 (80.4)**	**49 (19.6)**

Attitudes Towards Ebf

Individual questions regarding health care workers' attitudes on exclusive breastfeeding are shown in Table 3. In total 47.6% (N = 119) health providers had positive attitudes towards exclusive breastfeeding. Six out of ten providers felt they can comfortably support women for EBF for six months and could advice working mothers to express breast milk for their infants. However, a substantial proportion 36% (N = 89) of the respondents were of the opinion that exclusively breastfed babies could be introduced to fruit juice and light porridge at 4 months, 43% (N = 108) of HCWs believed infants will feel thirsty on breast milk alone and 26% (N = 65) believed HIV positive mothers need to be advised not to breastfeed. Respondents with advanced diploma/degree were three times more likely to have positive attitudes towards EBF than those with lower qualifications (AOR, 2.80, 95% CI, 1.01–7.79).

Age, cadre, years of experience, district and facility ownership were not associated with attitudes towards EBF see Table 3

Table 3
Attitudes of health care providers towards exclusive breastfeeding in Kilimanjaro region, Tanzania (N = 250)

Attitude	**Level of agreement n (%)**	
	Agree[a]	**Disagree[b]**
1. Mothers of unknown HIV status need to be advised to exclusively breastfeed the baby up to the age of six months	159 (63.6)	91 (36.4)
2. Health care providers can comfortably support mothers to breastfeed exclusively up to the age of 6 months.	156 (62.4)	94 (37.6)
3. Working mothers can be advised to express breast milk for their babies to be fed while away	146 (58.4)	104 (41.6)
4. HIV positive mothers need to be advised not to breastfeed [c]	65 (26.0)	185 (74.0)
5. Exclusively breastfed baby should be introduced fruit juices and light porridge at 4 months [c]	89 (35.6)	161 (64.4)
6. Babies 0–6 months who are exclusively breastfed get enough water from the breast milk, does not feel thirsty	142 (56.8)	108 (43.2)
7. Breast milk does not go bad if the baby is terminated shortly on emergency	126 (50.4)	124 (49.6)

[a] *Agree includes all who responded, "strongly agree" and "agree".*

[b] *Disagree includes all who responded "disagree" and "strongly disagree."*

[c] *Disagree or strongly disagree is the correct response*

Health Care Workers Supportive Practices Towards Ebf

Nearly 94% (N = 234) health care providers reported that they were actively counselling women on exclusive breastfeeding. Many providers 63.6% (N = 159) reported that, they had taught and supported mothers on proper positioning and attachment of the baby to the breast. But when asked to mention four important steps for good positioning and attachment, the vast majority (93%) were not able to mention the steps of good positioning or attachment of the baby to the breast (Table 4).

Further, supportive practice on EBF was assessed by asking respondents how they usually advise lactating women who complain of not having enough milk, to breastfeed their babies. The majority of health workers 89.2% (N = 223) reported to have attended women with such complain. But only 52% of the providers gave correct responses regarding on what women should do in case they reported to have poor flow of milk (Table 4). Overall score on teaching skills for EBF was low, ranging from 0–11, with mean score of 4.4 (SD, ± 2.1). This was based on a maximum score of 12 points with 7 points or more categorized as good practice. Out of the 250 healthcare workers, only 17% (N = 43) showed acceptable skills in all three areas assessed. Respondents who worked at Siha district were twice as likely to have good EBF practice compared with those in Hai (AOR 2.4, 95% CI: 1.2–4.8). Likewise health providers working in private facilities (AOR 2.5, 95% CI: 1.3–4.8) were 2 times more likely to have good EBF practice compared to others.

Table 4
health care provider's supportive practices to lactating women regarding position, attachment and stimulation of milk flow in Kilimanjaro region, Tanzania

Advice	Frequency	Percent
Positioning		
1.Baby's head & body incline	46	18.4
2.Baby held close to mother's body	65	26.0
3.Baby's whole body supported	106	42.4
4.Baby's approaches breast nose to nipple	16	6.4
Overall health providers with good positioning skills	**18**	**7.2**
Attachment		
1.More areola above baby's lip than below bottom lip	28	11.2
2.Baby's mouth wide open	51	20.4
3.Lower lip turned outward	51	20.4
4.Baby's chin touches breast	38	15.2
Overall health providers with good attachment skills	**18**	**7.2**
Advice/support on facilitation of milk flow		
1.Give the baby little water and glucose for first few hours [a]	93	37.2
2.Advice mother to put the baby to the breast regularly	127	50.8
3.Provide psychological support and massage the back	183	73.2
4.Advice on mother's diet	228	91.2
Overall health providers with good advice/ support	**131**	**52.4**

[a] *Yes response was a wrong response*

During observation of key supportive practice on EBF by health facilities using a structured checklist, all the 10 assessed health facilities had IEC materials on the walls regarding breastfeeding and were practicing rooming-in, see Table 5. There was however lack of IEC materials for women to read at home. Regarding counselling on breastfeeding, five (50%) of facilities with labour/maternity wards were observed to give breastfeeding & exclusive breastfeeding lessons to post-delivery women who were still in the ward. Majority (90%) were giving theoretical information focusing on definition of EBF, duration EBF/ BF, and advantages of breastfeeding. There was only one facility (Siha District hospital) where they demonstrated positioning and attachment, counselled women on early initiation of BF, demand feeding, management of breastfeeding problems and did individual counselling and women had to demonstrate skills in proper positioning and attachment and breastfeeding in general before they were discharged.

Table 5
Assessment of key supportive practices on breastfeeding by health facilities (N = 10)

Item assessed	Available/ observed
Information, Education and Communication materials on breastfeeding	10/10
Information, Education and Communication materials for women to take home	0/10
Breastfeeding policy/ guidelines	3/10
Bottle feeding at maternity/ RCH clinic	0/10
Powdered milk	0/10
Baby cots in postnatal/ labour ward	0/10
Counselling on breastfeeding/ EBF (provider-client interaction)	5/10
Content of counselling in the 5 facilities	5/5
- Definition, duration, advantages of EBF	1/5
- Early initiation of BF (within 1 hour)	1/5
- Breastfeeding on demand	1/5
- On good positioning and attachment	1/5
- On management of breast problems in case arise	0/5
- Use of visual materials/pictorials during counselling	
Practical demonstration of position and attachment at post-natal ward (before discharge) at the 5 facilities	1/5

Discussion

The study findings showed that health care workers in this study had good knowledge of EBF (80%). While other researchers use only the WHO definition to assess knowledge on EBF, multiple questions were used to evaluate the level of knowledge on EBF in this study, and still the theoretical knowledge was high (14, 22). Similar results of high knowledge were found in Ibadan, Nigeria where 90% of health workers had good knowledge of duration for EBF including advantages of breastfeeding. (23). Okolo & Ogbonna (2002) in Nigeria assessed the level of knowledge, attitude and practice among health workers on BFHI practices and found that only 20.8% of health workers were aware of the need for initiating breastfeeding within 30 minutes of birth while 92% of health providers in our study knew the correct time of BF initiation (22).

In this study health care workers who have attended in-service training on breastfeeding had increased odds to have good knowledge of EBF as the non attendee group. This is similar to studies in Kenya and Nigeria which showed improvement in breastfeeding knowledge among health workers after training on

breastfeeding (22, 24). During the survey it was noted that, the two districts involved in this study were among seven districts in Tanzania which received intensive support from UNICEF for implementation of breastfeeding promotion activities including other programmes on child survival and development hence, the situation may differ from other districts which did not receive such support.

Nearly 4 out of 10 health care workers believed that babies who are exclusively breastfed do not get enough water from the breast milk and others felt that babies should be introduced to fruit juice and light porridge at the age of four months. Giving babies anything other than breast milk in the first six months interferes with demand suckling and increases the risk of both diarrhoea and respiratory infections (5, 7, 21, 25). These beliefs might have negative impact on EBF. Studies have observed that, in some societies, health workers recommendations and information are highly valued by mothers and they often take their recommendations as the final word (9, 14). If health care gives mixed and incorrect messages it will confuse many women attending the RCH services as health care workers are believed to be the primary source of accurate and helpful information to mothers regarding most issues in maternal and child health including EBF (9). It is also important to note that 74% of health subjects in this study reported to have received information on breastfeeding and EBF from training. These identified gaps need to be rectified or addressed during pre and in-service training of providers in breastfeeding.

In this study, one in four health care workers felt that HIV-positive women need to be advised not to breastfeed. This is contrary to the national guidelines which states that all the HIV positive women should exclusive breastfeed their infants for the first six months, and advised otherwise only if alternative feeding is affordable, available, feasible, safe and sustainable (26). With most developing countries moving to option B + i.e. treating every HIV-positive pregnant and breastfeeding woman with triple antiretroviral therapy, the chance of breast milk transmission is low. Thus WHO in 2010 and Tanzania in 2013 have changed the advice and currently HIV-positive women also should exclusively breastfeed their infant for six months, and can continue to breastfeed up to 12 months of age (27, 28). These rapid change of recommendations in infant feeding among HIV-positive women needs to be rapidly disseminated to providers on the ground, as studies have observed it may take years for providers to became aware that guidelines have changed (29).

The vast majority of health care providers in this study had poor skills despite having good knowledge on EBF. Two thirds of the respondents indicated they had taught and supported mothers on proper positioning and attachment of the baby to the breast but surprisingly, only one in ten could list correct steps for good positioning and attachment to demonstrate the quality of practical skills to support mothers on EBF. Good positioning and attachment are two most important skills every lactating mother needs to be taught to comfortably establish EBF, maintain breastfeeding and prevent development of breast problems like engorgement and cracked nipples (21). Breast problems are among the factors negatively influencing duration of EBF (30).

Poor skills in supporting breastfeeding have also been observed in Nigeria where, only 5.2% of health workers interviewed were able to demonstrate correct positioning of the baby for breastfeeding (22). This

calls for the need to assess the current training on breastfeeding for health care providers in the country and change the curriculum to emphasize on development of clinical/practical skills (24). Competence based training using mannequins and videos which have been shown to improve clinical skills among health care workers in performing signal functions of emergency obstetric care should be applied to breastfeeding trainings (31). Only one health facility was observed to give practical demonstrations to postnatal women on how to position and attach the baby to establish breastfeeding within the 24 hours after delivery. It might be that providers are not teaching practical skills due to lack of skills themselves. Or it may be due to the fact in many facilities there is severe shortage of human resources resulting into low quality of care (32). This is a missed opportunity given that 86% and 96% of women in Kilimanjaro deliver at health facilities with skilled providers in the year 2010 and 2016 respectively (4, 11). Studies have shown a correlation between women's intentions to EBF, confidence or skills in breastfeeding and duration of exclusive breastfeeding (18–20, 24). The need to improve breastfeeding practices as one of the strategies to improve neonatal and child health and attain the sustainable development goal 3 of promoting wellbeing (33). One of the things to target is improving health provider's skills in supporting breastfeeding and improving their knowledge and skills in broader topics pertaining to reproductive, maternal, newborn and child health so as to offer holistic and integrated care.

The study has some limitations. Information on practices of health care providers on skills in supporting women was obtained from interviews, and observation of individual providers was not performed. To get more information, future studies should use real time clients or mannequins to assess the skills of providers. Also observations conducted at postnatal wards on supportive practices to initiate and maintain breastfeeding took a day at each site. We may have thus underreported facilities were not performing the practices e.g. management of breast conditions (cracked nipples), but perhaps in practice they sometimes do offer support.

Conclusions

Despite the limitations, the findings show that the majority of health care providers had good theoretical knowledge on EBF but lacked important skills to support women in breastfeeding practices. Also very few maternity wards facilities use the opportunity to educate women on exclusive breastfeeding. Training of health providers on breastfeeding should specifically aim to improving health care providers' practical skills on positioning, attachment and what to do in case women complain of not having enough milk.

Declarations

Ethics approval and consent to participate

Ethical approval to carry out the research was obtained from KCMU –College Research and

Ethical Review Committee and permission to carry out the study in the respective health facilities were sought from District Medical Officer (DMOs) of Hai and Siha districts, and in-charges of the participating

health facilities. Signed informed consent was obtained from the participants.

Consent for publication

Not applicable

Availability of data and materials

Data available upon request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

BM, MM, and SEM: Conception and Designing of the study. BM collected the data. DJD, CA, and BJL: analyzed the data. BM prepared the initial manuscript. All authors read and approved final manuscript before submission.

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References

1. WHO. Exclusive breastfeeding for optimal growth, development and health of infants: WHO; 2019 [Available from: https://www.who.int/elena/titles/exclusive_breastfeeding/en/.
2. WHO, UNICEF. Countdown to 2015 maternal, newborn and child survival: building a future for women and children. Washington DC: World Health Organization and UNICEF. 2012.
3. Yalçin SS, Berde AS, Yalçin S. Determinants of exclusive breast feeding in sub-Saharan Africa: a multilevel approach. Paediatric and perinatal epidemiology. 2016;30(5):439-49.
4. Ministry of Health CD, Gender, Eldery and Children (MoHCDGEC) [Tanzania Mainland], Ministry of Health (MoH) [Zanzibar[National Bureau of Statistics (NBS); Office of the Chief Government Statistician (OCGS) and ICF International. Tanzania Demographic Health Survey and Malaria Indicator Survey (TDHS-MIS). 2015-16.
5. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, De Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. The lancet. 2013;382(9890):427-51.

6. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. Cochrane database of systematic reviews. 2012(8).
7. Arifeen S, Black RE, Antelman G, Baqui A, Caulfield L, Becker S. Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. Pediatrics. 2001;108(4):e67-e.
8. Iliff PJ, Piwoz EG, Tavengwa NV, Zunguza CD, Marinda ET, Nathoo KJ, et al. Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. Aids. 2005;19(7):699-708.
9. Shirima R, Greiner T, Kylberg E, Gebre-Medhin M. Exclusive breast-feeding is rarely practised in rural and urban Morogoro, Tanzania. Public Health Nutrition. 2001;4(2):147-54.
10. Fjeld E, Siziya S, Katepa-Bwalya M, Kankasa C, Moland KM, Tylleskär T. 'No sister, the breast alone is not enough for my baby'a qualitative assessment of potentials and barriers in the promotion of exclusive breastfeeding in southern Zambia. International breastfeeding journal. 2008;3(1):26.
11. National Bureau of Statistics (NBS) T, and ICF Macro. Tanzania Demographic and Health Survey 2010. 2011.
12. MOHSW. National Guidelines for Comprehensive Care of Prevention of Mother-to- Child Transmission of HIV Services. Ministry of Health and Social Welfare, Dar es Salaam, Tanzania.; 2012.
13. Mgongo M, Mosha MV, Uriyo JG, Msuya SE, Stray-Pedersen B. Prevalence and predictors of exclusive breastfeeding among women in Kilimanjaro region, Northern Tanzania: a population based cross-sectional study. International breastfeeding journal. 2013;8(1):12.
14. Nkala TE, Msuya SE. Prevalence and predictors of exclusive breastfeeding among women in Kigoma region, Western Tanzania: a community based cross-sectional study. International breastfeeding journal. 2011;6(1):17.
15. Aidam BA, Perez-Escamilla R, Lartey A, Aidam J. Factors associated with exclusive breastfeeding in Accra, Ghana. European journal of clinical nutrition. 2005;59(6):789.
16. National Bureau of Statistics (NBS) T, and ORC Macro. . Tanzania Demographic and Health Survey 2004–2005. 2005.
17. Aruldas K, Khan M, Hazra A. Increasing early and exclusive breastfeeding in rural Uttar Pradesh. The Journal of Family Welfare. 2010;56(special issue 2010):43-50.
18. Pérez-Escamilla R. Evidence based breast-feeding promotion: the Baby-Friendly Hospital Initiative. The journal of nutrition. 2007;137(2):484-7.
19. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Effect of maternity-care practices on breastfeeding. Pediatrics. 2008;122(Supplement 2):S43-S9.
20. Merten S, Dratva J, Ackermann-Liebrich U. Do baby-friendly hospitals influence breastfeeding duration on a national level? Pediatrics. 2005;116(5):e702-e8.

21. WHO. Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. 2009.
22. Okolo S, Ogbonna C. Knowledge, attitude and practice of health workers in Keffi local government hospitals regarding Baby-Friendly Hospital Initiative (BFHI) practices. European journal of clinical nutrition. 2002;56(5):438.
23. OlaOlorun FM, Lawoyin TO. Health workers' support for breastfeeding in Ibadan, Nigeria. Journal of Human Lactation. 2006;22(2):188-94.
24. Bradley EJ, Meme J. Breastfeeding promotion in Kenya: changes in health worker knowledge, attitudes and practices, 1982–89. Journal of tropical pediatrics. 1992;38(5):228-34.
25. Betrán AP, de Onis M, Lauer JA, Villar J. Ecological study of effect of breast feeding on infant mortality in Latin America. Bmj. 2001;323(7308):303.
26. WHO. HIV and infant feeding: guidelines for decision-makers. 2003.
27. MOHSW. National Guidelines for Comprehensive Care Services for Prevention of Mother-to-Child Transmission of HIV and Keeping Mothers Alive. Ministry of Health and Social Welfare, Dar es Salaam, Tanzania; 2013.
28. WHO. Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants: recommendations for a public health approach-2010 version: World Health Organization; 2010.
29. Moland KMI, De Paoli MM, Sellen DW, van Esterik P, Leshabari SC, Blystad A. Breastfeeding and HIV: experiences from a decade of prevention of postnatal HIV transmission in sub-Saharan Africa. BioMed Central; 2010.
30. Qiu L, Zhao Y, Binns CW, Lee AH, Xie X. Initiation of breastfeeding and prevalence of exclusive breastfeeding at hospital discharge in urban, suburban and rural areas of Zhejiang China. International Breastfeeding Journal. 2009;4(1):1.
31. Ameh C, Adegoke A, Hofman J, Ismail FM, Ahmed FM, Van Den Broek N. The impact of emergency obstetric care training in Somaliland, Somalia. International Journal of Gynecology & Obstetrics. 2012;117(3):283-7.
32. MOHSW, USAID a. Assessment of Reproductive and Child Health Integration in Tanzania: challenges and opportunities. 2012.
33. Adams TD, Hammoud AO, Davidson LE, Laferrere B, Fraser A, Stanford JB, et al. Maternal and neonatal outcomes for pregnancies before and after gastric bypass surgery. International journal of obesity (2005). 2015;39(4):686-94.

Figures

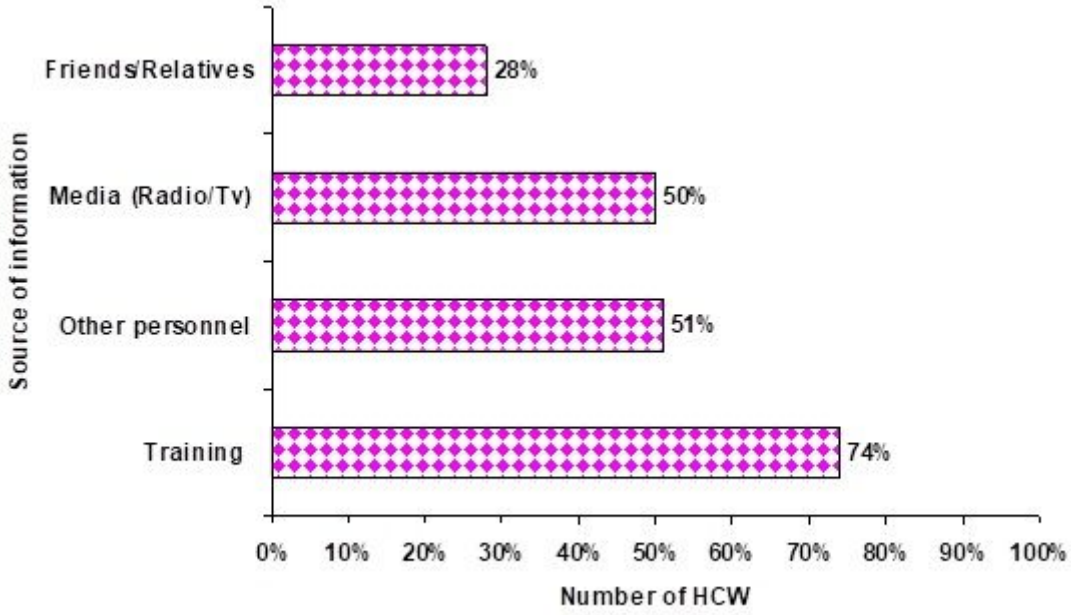

Figure 1

Source of exclusive breastfeeding information among 250 health care providers in Kilimanjaro region, Tanzania