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Seeking health information in rural context: Exploring sources of maternal health information in rural Tanzania

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Abstract

Sources of information differ with regard to the extent to which it is obtained to meet the information needs of the information users. This study examined the sources of information used by women in rural Tanzania to meet their different maternal health information needs. In all, 380 women of the reproductive age were involved in the study. The study utilised a mixed methods research approach that integrates both the qualitative and quantitative dimensions of research. Information from respondents was collected using questionnaires and focus group discussions. The study found that women used different sources of information to satisfy their maternal health information needs. Despite the majority of the women (93%) preferring to use professional healthcare workers as their sources of information, they received most of it from the informal sources such as community healthcare workers (CHWs), traditional birth attendants (TBAs), and their immediate family members. The use of the informal sources by the majority of the women was attributed to limited access to professional healthcare in most of the villages under review. The study recommends that while improvement of access to professional health care in rural areas is imperative, empowerment of CHWs and TBAs is also necessary for them to be able to provide timely and relevant maternal health information to the expectant mothers in all areas where health facilities are not available.

Key words: *Maternal health information, maternal mortality, sources of information, pregnant women, rural Tanzania.*

1.0 Introduction

Although women are not necessarily ill during their respective pregnancies, the possibility that a complication may occur is potentially serious; as such, routine health care visits and checks are highly desirable (Matthews *et al*., 2001). Providing them with timely and relevant

maternal health information to help them make informed decisions, which are essential in reducing pregnancy-related complications that may result in maternal morbidity and mortality. Evidence from previous studies show that better informed people are more likely to cope with illness, make informed decisions about their treatment options, manage chronic conditions and maintain their own health and the health of those in their care (Zhang *et al*., 2012). On the other hand, those who are ill-informed are likely to make poor decisions that can have adverse repercussions for their health (Soltani & Dickinson, 2005).

Access to maternal health information among pregnant women will not only help them to prevent complications and detect abnormalities of both the mother and her unborn baby (Das, 2013), but also encourage them to seek and utilise maternal health care services available in a timely manner (Thassri *et al*., 2000) and influence their perceptions of both pregnancy and childbirth (Collins, 2007). Access to maternal health information has also been documented to increase the women's knowledge on their health and thus increase their compliance and adherence to medical regimes (Shieh *et al*., 2009) which, in turn, can help reduce delays in making decisions to seek appropriate care during pregnancy and, thus, reduce chances of both maternal morbidity and mortality.

Although effective utilisation of maternal healthcare services is associated with access to maternal health information (Thassri et al., 2000), evidence from research shows that the decision to utilise healthcare services is influenced factors such as the sources of information used to obtain such information (Ramanadhan & Viswanath, 2006). In fact, studies have long established that health information obtained from relevant and credible sources of information influence positive behavioural change by increasing the motivation to utilise the healthcare services available for improved health outcomes (Worsley, 1989).

Whereas access to maternal health information through credible sources of information is constitutes a key resource in the reduction of maternal morbidity and mortality, women living in rural areas, particularly in developing countries sub-Saharan Africa, for example, are reportedly the most disadvantaged when it comes to accessing maternal health information due to limited access to formal and informal sources of health information (Owino *et al*.,

2014). In consequence, these women are isolated from accessing this important information that could otherwise help them make informed decisions regarding their reproductive health.

In Tanzania, women in rural and remote areas lag behind that of their urban-dwelling counterparts in terms of general access to information (Siyao, 2010) and access to maternal health information in particular (MAMA, 2013). Overall, the healthcare services offer in rural areas of Tanzania do not meet various complex health problems that women face during their long reproductive age, hence increasing their chances of suffering from maternal mortality.

Maternal mortality represents about 17 percent of all the deaths in women aged 15 – 49 years in Tanzania (NBS & ICF Marco, 2011) and that about 7,900 women die annually due to complications arising from pregnancy and childbirth (MoHSW, 2014). Whereas previous reports on maternal health showed a decline in maternal mortality rate from 910 deaths in 1990 to 410 deaths in 2013 per 100,000 live births (TNBS & Macro, 2011), a recent report shows that the rate has increased from 410 deaths to 556 deaths per 100,000 live births (MoHCDGEC *et al*., 2016), thus suggesting that maternal mortality is still a major problem in Tanzania. The majority of these deaths are still occur among the marginalised communities and the poor who reside in rural and remote areas where access to healthcare remains a problem (USAID, 2014).

2.0 Objective of the study

This study examined sources of information women in rural Tanzania use to access different types of maternal health information.

3.0 Literature review

Despite maternal health information being significant in addressing maternal mortality, relatively little is known about the sources of information women in rural Tanzania use to meet their different maternal health information needs. Since health information seeking varies among people depending on the type of information they seek and their sources to meet their information needs (Higgins *et al*., 2011), understanding the sources women in rural areas use to meet their information needs is key to meeting effectively their maternal health information needs.

A few available studies on health information seeking behaviour in Tanzania have focused their attention on health issues other than on maternal health. Other studies on information seeking behaviour have directed their attention to the information seeking behaviour of professionals and students residing in urban areas. In their studies, Laki (2008) and Lwoga and Mosha (2013) have focused on the information seeking behaviour of healthcare providers and parents and caregivers of children with mental illness in public hospitals, respectively, and not on women of the reproductive age.

Other studies of information seeking behaviour in Tanzania (Mwenda, 2012; Norbert & Lwoga, 2012) have dwelled on how professionals in urban areas seek and utilise information as they perform their daily work roles and tasks while neglecting the information seeking behaviour of ordinary citizens. On the other hand, some studies have looked at the information seeking behaviour of students from secondary schools and universities at different levels in both traditional and electronic settings (Elia, 2006; Juma, 2011).

The gap left by this focus on professionals in urban areas—the information seeking behaviour of ordinary citizens, including women—has been noted by studies on information behaviour that have been conducted outside Tanzania. In their studies, Vakkari (2008) and Iqbal, Yousaf and Soroya (2013) have noted that for a long time, research on the information behaviour of professionals residing in urban areas in Library and Information Science have been over-represented compared to research on ordinary citizens, thus "marginalising the majority of people living in rural villages" (Maepa, 2000, p. 6).

In addition, in her review of the literature on information behaviour studies in developing countries, Dutta (2009) observed a dearth of studies on information seeking of ordinary citizens living in rural areas, as most of the studies available have concentrated on professionals living in urban areas. This, according to Dutta, is associated with the researchers' fondness for conducting research in areas where they work or live. She, therefore, calls for more studies to be conducted to investigate the information seeking behaviour of ordinary—uneducated citizens in rural areas so as to fill this knowledge gap.

3.1 Sources of maternal health information used by women in rural areas

Studies on information behaviour have identified different sources of information women in rural areas use to satisfy their maternal health information needs. The use of health care workers as sources of information was established in the studies by Davies and Bath (2002) and Das and Sarkar (2014). In these studies, the usage of healthcare workers as sources of maternal health information was primarily because these sources were highly trusted and perceived to provide relevant and accurate health information. In their study, Davies and Bath (2002) report that most of their study participants were motivated to consult the healthcare workers because they gave them an opportunity to ask questions and, hence, they were assured that their maternal health information needs could be met.

On the other hand, studies conducted in rural Nigeria (Nwagwu & Ajama, 2011; Saleh & Lasisi, 2011) revealed that regardless of the availability of professional healthcare workers, women preferred to seek health-related information from traditional informal sources of information such as traditional healers, traditional birth attendants, faith healers, family and friends, drug hawkers, and home priests. They consulted these sources because they perceived them to be more reliable and authentic. Professional healthcare workers were only consulted when illness became critical. In another similar study, the use of informal sources such as family as a source of health-related information, particularly maternal health information was associated with higher levels of perceived informational support and lower levels of pregnancy uncertainties (Song *et al*., 2013).

However, the use of informal sources of information has received different appreciation from researchers. Although the use of these sources is described as important in places where there is limited access to professional healthcare (Ford & Kaphingst, 2009), other researchers have found fault with their use, pointing out their limited knowledge on human health (Nwagwu & Ajama, 2011) and that information provided by these sources might conflict with information obtained from healthcare workers (Song *et al*., 2013) thus create anxiety among the patients (Malata & Chirwa, 2011). Ruppel and Rains (2012, p. 388) assert that it is important for patients to seek health information from professional healthcare workers since they possess medical expertise and, as such, they are "generally a source of authoritative and reliable information about health".

The use of mass media such as radio, television, newspapers and magazine as sources of health information was reported in studies by Bakar (2011), and Hossain and Islam (2012). In these studies, users extensively used these sources because they found them to be relatively cheaper and more affordable than other sources of information. Other studies on information seeking behaviour have reported low usage of mass media as sources of health information among women. Some women found these sources to be such a luxury that only men could afford them (Saleh & Lasisi, 2011). Also, some studies have reported that most of these sources did not communicate health information (Nwagwu & Ajama, 2011) and were time-consuming, unlike interpersonal sources such as healthcare workers (Davies & Bath, 2002).

Generally, the literature reviewed shows that many women in rural areas seek health information from multiple sources. Although this behaviour may indicate women's uncertainty about the information provided by one source, still this approach helps to supplement and validate the health information obtained from different sources. Subsequently, this approach may increase the possibility of influencing positive healthy behaviours among women. However, evidence from the literature also shows that despite seeking health information from multiple sources, many women still seek this type of information from informal sources.

4.0 Methodology

This study utilised a mixed methods research design that integrates both quantitative and qualitative research methodologies. The study involved women of the reproductive age between 15 and 49. The sample was drawn from eight villages selected purposively from four wards: Mpwapwa Town, Ving'hawe, Lupeta and Mazae from Mpwapwa District in Dodoma Region, Central Tanzania. In all, 396 women, both expectant and those who had under-one year children were involved in the study.

Data for the study was collected using questionnaires and focus group discussions (FGDs). Whereas 380 women were involved in questionnaire survey, 16 participated in two FGDs. The questionnaire asked women to indicate the sources of information that they would like to

use for their different maternal health information needs. In this regard, an open-ended question in both the questionnaire and in FGDs was used to solicit information on the exact sources of information women in rural areas normally used in meeting their different maternal health information needs. The questionnaire facilitated the collection of data at both the health facilities of the selected villages where these facilities were available and at home in the villages where they were not. For women attending antenatal/postnatal clinics, data were collected either before or after they had received healthcare services. Due to the nature of this study, ethical clearance was obtained from the National Institute for Medical Research (NIMR). Informed verbal consent was also sought from all the participants.

Both quantitative and qualitative data from the study were analysed. Quantitative data obtained from questionnaires were organised, coded and analysed using the IBM SPSS Statistics (Version 21) to provide statistical data that were used to examine the variables of the study using tables. Qualitative data from the study were subjected to content analysis. Audio records obtained from FGDs were transcribed and different themes from the written transcripts were identified and highlighted. The themes were then reviewed and those which were similar were grouped together.

5.0 Results and Discussion

5.1 Socio-demographic characteristics of the respondents

The socio-demographic characteristics of the respondents are the most useful determinants of respondents' tendency to seek health care (Titus *et al*., 2015) from different sources. Johnson and Meischke (2006) posited that people's use of various sources of health information varies based on their age, sex, educational level and sometimes their race. The socio-demographic characteristics of the respondents in the present study were used to determine their utilisation of different sources of maternal health information that they use to meet their different maternal health information needs.

Table 1: Socio-demographic characteristics of respondents (N = 380)

Variables	Frequency	Percentage
Age group (years)		
15 -19 years	74	19.5

20 - 24 years		111	29.2
25 - 29 years		76	20.0
30 - 34years		63	16.6
35 - 39 years		33	8.7
40 - 44 years		20	5.3
45 - 49 years		3	0.8
Marital status			
Single		71	18.7
Married		292	76.8
Separated		14	3.7
Widowed		3	0.8
Pregnant status			
Pregnant		189	49.7
Not pregnant		191	50.3
Gestational age of pregnant women (N = 198)			
First Trimester (week 1 - 13)		13	6.9
Second Trimester (week 14 - 26)		46	24.3
Third Trimester (week 27 - 40)		129	68.3
Others		1	0.5
Level of education			
Non-formal		102	27
Primary		217	57
Secondary		52	14
Post-Secondary		9	2
Levels of income per week			
Tanzanian Shillings	**USD**	85	22.4
More than 50,000	22.4		
10,000 – 20,000	4.5 – 9	73	19.2
5,000 – 10,000	2.2 – 4.5	80	21.1
2,000 – 5,000	0.9 – 2.2	100	26.4
Dependent		42	11.1

Source: *Field Data (2015)*

Table 1 presents the socio-demographic characteristics of the women involved in the study. Out of 380 women involved, 74 (19.5%) were aged between 15 and 19 years, 111 (29.2%) were aged 20 - 24 years, 76 (20%) were aged between 25 and 29 years, 63 (16.6%) were aged 30 - 34 years, 33 (8.7%) were aged between 35 and 39 years, and 20 (5.3%) were aged between 40 and 44 years. Only a small proportion of the women respondents, that is, three (0.8%) were aged between 45 and 49 years. Findings from the study indicate that the majority of the respondents were below 35 years, thus suggesting that the study population was made

up by younger people which, in turn, indicates a longer reproductive age group. The majority of the respondents, 292 (76.8%), were married.

Table 1 further shows that 189 (49.7%) respondents were expectant mothers whereas 191 (50.3%) had under-one year children, thus indicating almost same representation of the respondents from both categories. Of all pregnant women, 13 (6.9%) were in their first trimester, 46 (24.3%) were in their second trimester and 129 (68.3%) were in their third trimester. Only a small proportion of the pregnant women, that is, one (0.5%) had exceeded the normal gestational age that ranges from 38 to 42 weeks, meaning that she had an overdue pregnancy which is considered as one of the signs of pregnancy complication and an important factor for perinatal death among pregnant women (WHO, 2000; Weiner et al., 2003).

As Table 1 illustrates, the majority of the respondents, 292 (57%), had attained primary level education, with over a quarter 102 (27%) having a non-formal education. The fact that majority of the women reported non-formal and primary education as their highest level of education clearly typifies the levels of education of the rural population in Tanzania. This, however, is attributed to lower rates of girls' transition to secondary and higher education than that of boys, which is a result of factors such as domestic activities performed by girls at home, poverty, early marriage, early pregnancy, and poor quality of learning environments, for example, lack of hostels and long distance to schools (Machimu & Minde, 2010; Stein, 2014). In addition, patriarchal values still prevalent in Tanzania's rural houses=holds disadvantages the girl-child. In fact, the low level of education among women in rural areas may in one way or another affect their utilisation of different sources of maternal health information.

Economically, over half of all the women, 253 (66.7%), had an income that ranged from TZS 2,000 to 20,000 (0.9 – 9 USD) per week, while few 85 (22.4%) earned an income of more than TZS 50,000 (22.4 USD) per week. Of the respondents, 42 (11.1%) were dependant on either their parents (guardian) or their male partners.

5.2 Sources of maternal health information

For any meaningful information to be provided, relevant sources of information must be available so that the information sought is ideal to enable meaningful decision-making (Yusuf, 2012). In the present study, women respondents were asked to state both the sources of information that they would like to use in meeting their different maternal health information needs and the exact sources of information that they normally use to satisfy their information needs. The following sub-sections present findings from the respondents on these aspects.

5.2.1 Quantitative findings: Sources of information likely to be used by women to obtain maternal health information

The analysis of the findings from questionnaires indicates that women respondents would like to use various sources of information to meet their different maternal health information needs. Table 2 presents a summary of the findings from the respondents:

Table 2: Sources of information likely to be used by respondents to obtain maternal health information (N = 380)

Sources of Information	Frequency	Percentage
Interpersonal Sources		
Doctors	353	93
Nurse-Midwives	350	92
Mother	304	80
Female Relatives	304	80
Husband (Male Partner)	262	69
Mother-in-Law	232	61
Traditional Birth Attendants (TBAs)	167	44
Religious Leaders	148	39
Women Groups	137	36
Non-Government Organizations (NGOs)	122	32
Mass media Sources		
Radio	296	78
Television	156	41
Newspapers	129	34
Other Sources		
Mobile Phones	4	1

Source: Field Data (2015)

Table 2 indicates that nearly all the women respondents would like to seek maternal health information from healthcare workers. Table 2 shows that, whereas 353 (93%) respondents indicated that they would like to seek maternal health information from doctors, 350 (92%) mentioned that they would like to seek such information from nurse-midwives. The findings indicate that the majority of the women would like to seek information from healthcare workers because they found healthcare workers to be authoritative sources of information because of their medical expertise as reported in previous studies (see, for example, Ruppel & Rains, 2012; Das & Sarkar, 2014). Ruppel and Rains (2012) found that the main characteristic of the source of health information is the "degree to which the source provides access to medical expertise which involves the possession of medical training" (p. 388). They concluded that because of such expertise, seeking health information from professional healthcare workers becomes the primary objective of the information seekers. These observations underscore the importance of healthcare workers in the provision of relevant and reliable maternal health information to pregnant women.

Table 2 also indicates that the majority of the respondents would like to seek maternal health information from their immediate family members. Results presented in Table 2 shows that 304 (80%) women would like to use their mothers and other female relatives as their sources of maternal health information. Over half of the responding women, 262 (69%), and 232 (61%) also indicated that they would like to seek information from their male partners and their mothers-in-law, respectively. Generally, during pregnancy, women experience different challenges—both physical and emotional—which require support from their family members. Therefore, seeking information from them may imply that the women also expected to get emotional support in addition to the maternal health information they needed. Previous studies have also reported similar findings (Nwagwu & Ajama, 2011; Das & Sarkar, 2014).

Table 2 further shows that 167 (44%) respondents indicated that they would like to seek information from traditional birth attendants (TBAs). The finding that over half of all women were not likely to seek information from TBAs may suggest that these were not trusted by the majority of the respondents. Evidence from previous research indicates that most of the TBAs do not have access to the required delivery tools such as drugs and other necessary equipment

as well as access to referral services to the hospital in case of complications during and after labour (Vyagusa *et al*., 2013). This contributes to increasing risk of maternal death among pregnant women intending to deliver at home. Therefore, the finding in the present study may also suggest an increasing awareness among women of the risk of maternal deaths that is associated with the utilisation of TBAs as sources of maternal healthcare.

As Table 2 demonstrates, a few respondents, that is, 148 (39%), 137 (36%) and 122 (32%) indicated that they would like to seek information from their religious leaders, women groups, and non-governmental organisations (NGOs), respectively. The fact that the majority of the respondents were not likely to seek information from these sources may suggest that these sources were not popular among most of them. This may also indicate that the majority of the respondents did not consider these as sources from which they could get maternal health information.

Among the three mass media sources identified, only the radio was likely to be used by the majority of the respondents as opposed to other media sources namely television and newspapers. Table 2 indicates that, although over two-thirds, 296 (78%), of the respondents indicated that they would like to use the radio as their source of maternal health information, less than half, that is, 156 (41%) and 129 (34%) indicated that they would like to use television and newspapers, respectively, as their sources of maternal health information. The finding that the majority of the respondents were likely to use radio as their source of maternal health information could be because radio is a relatively cheap means for acquiring information for many people as opposed to television and newspapers. Apart from being cheap, evidence from previous studies indicates that most of the rural population prefer to use the radio as their source of health information to the print sources because of its ability to reach large audience and use of minimal intellectual effort (Ghanta, 2012; Sam & Dzandu, 2015). These findings show that radio as a source of information has a big role to play in disseminating maternal health information and promoting maternal health in the rural areas.

When women respondents were asked to mention other means that they would like to use as their sources of maternal health information, only a small proportion, four (1%), mentioned

that they would like to use their mobile phones to access maternal health information. They pointed out that they were aware of mobile phone campaigns to improve maternal health from "*Wazazi Nipendeni Campaign"* (Parents Love Me) and/or M4RH (Mobile for Reproductive Health) which are campaigns devoted to providing maternal health information to pregnant women through subscription of free mobile phone messages. The finding that only a small proportion of women were ready to use their mobile phones to access maternal health information indicates low utilisation of mobile phones as a means for accessing health information by the majority of the women in the villages under review. This, however, is contrary to the findings by Lund *et al*. (2014) on mobile health which showed that the majority of the women in Tanzania were willing to use their mobile phones to access maternal health-related information. Low usage of mobile phones to access health-related information can be attributed to low awareness of the availability of these services by the majority of the women respondents and poor mobile phone network coverage in most of the studied villages. Other factors that might have contributed tothe low utilisation of mobile phones to access health-reated information include high illiteracy rates, low levels of experience in using mobile technology and lack of electricity as reported in previous studies (Noordam *et al*., 2011).

5.2.2 Qualitative findings: Exact sources of information used by the women to obtain maternal health information

Through an open-ended question in the questionnaire survey and in focus group discussions (FGDs), the women respondents were asked to identify the exact sources of information that they use to meet their different maternal health information needs. An analysis of the qualitative data revealed that women received most of the maternal health information from non-professional healthcare workers, namely community healthcare workers (CHWs) and traditional birth attendants (TBAs) and other informal sources such as their immediate family members such as their mothers, grandmothers, mothers-in-law, their male partners and other female relatives. The use of non-professional healthcare workers and other informal sources of maternal health information was associated with the unavailability or shortage of health facilities and professional healthcare workers in most of the studied villages. One participant during the discussion pointed out:

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> The health facility that we depend on is very far from here and as you can see we are also having problems with transport. In such a situation, we are compelled to rely on CHWs and our relatives on all matters related to maternal health. You may also find that some women here also rely on TBAs as their sources of maternal health information (FGD2, Women – Bumila Village).

Reproductive and maternal healthcare services were provided through outreach programmes in most of the studied communities; however, these services were perceived to be poor by the women and their families. During the discussion, participants raised their concern on the quality of healthcare services offered under these programmes. They claimed that inadequate time was allocated to these programmes and there were a small number of healthcare workers catering for a large number of women in need of those healthcare services. This led them to receive little or no information from the healthcare workers. As a result, women were compelled to seek maternal health information from non-professionals and other informal sources such as their immediate family members.

Previous studies have also reported the use of non-professional healthcare workers and informal sources of maternal health information (Nwagwu & Ajama, 2011; Das & Sarkar, 2014; Mwangakala, 2016; Silali & Owino, 2016). Although findings in the present study revealed that women used non-professional healthcare workers and their immediate family members because they had no viable alternative sources of maternal health information, findings from other studies such as Nwagwu and Ajama (2011) and Das and Sarkar (2014) showed that women preferred to use non-professionals and informal sources to obtain different health information despite having access to professional healthcare. This is because these sources were perceived to be more friendly, reliable and down-to-earth than professional healthcare workers.

A small number of participants in FGDs also mentioned that they receive maternal health information from different NGOs, both local and international dealing with maternal health. They cited NGOs such as Pamoja Tujenge Tanzania (Let Us build Tanzania together) (PATUTA), Mwanzo Bora (A Good Start), and Engender Health as their sources of maternal health information. As one woman in an FGD pointed out:

> Sometimes some people from NGOs come and teach us about various issues related to maternal health. I remember people from one NGO called PATUTA from Mpwapwa town who came and taught us issues related to importance of balanced diet during pregnancy and exclusive breastfeeding after delivery (FGD1 Women – Kisokwe Village).

Indeed, these NGOs do provide different maternal health information to women in rural areas. Findings from the study show that these NGOs use different strategies such as seminars and distribution of brochures and posters to disseminate maternal health information to the women. However, it was observed during the study that in all the villages where health facilities were not available, many posters containing maternal health information and other health-related information were displayed in village government offices where only a few women could see them since they rarely visit these offices. This, to some extent, deterred them from accessing this important information. This finding may explain why many women in the communities under review did not mention NGOs as sources of maternal health information.

An analysis of the qualitative data from FGDs also revealed that some pregnant women use their antenatal cards as sources of maternal health information. An antenatal card has records pertaining to the pregnancy, delivery expected date, date for the next antenatal clinic, types of vaccinations and any health problems between pregnancies (Leny *et al*., 2013). An antenatal card has been documented as an essential source of information both during pregnancy and after delivery (Essen *et al*., 1994). In the present study, participants pointed out that with the help of antenatal cards, they were able to know the progress of their own health and that of their unborn babies and, thus, made informed decisions regarding their maternal health. This finding underscores the importance of antenatal cards both in keeping maternal health records of the expectant mothers and in improving their maternal health.

Comparably, the analysis of both quantitative and qualitative findings in the present study suggests that, although the majority of the women were likely to seek maternal health information from professional healthcare workers, they received most of this information from informal sources. This indicates that it is not always that people want to seek information from informal sources. Sometimes they are compelled to do so because they do

not have access to other alternative formal and reliable sources of health information such as the professional healthcare workers.

5.2.3 Relationship between sources of maternal health information and socio-demographic variables of the women respondents

The Chi-square test was applied to determine whether there was any relationship between different sources of maternal health information and some of the respondents' socio-demographic characteristics. Four socio-demographic characteristics of the women respondents—age, gestational age, education, and income—were selected for this purpose. Table 3 presents a summary of the chi-square analysis:

Table 3: Relationship between sources of information and selected demographic variables of women respondents

Sources of Information	Socio-Demographic Variables (N = 380)							
	Age		Education		Income		Gestational Age	
	X^2	Sign. Value	X^2	Sign. Value	X^2	Sign. Value	X^2	Sign. Value
Husband	33.484	.094	7.144	.970	39.176	.006	17.250	.140
Mother	54.567	.000	23.986	.090	21.304	.379	16.993	.150
Mother in law	33.598	.092	14.892	.533	24.523	.220	10.244	.595
Doctor	5.859	.923	11.002	.202	26.907	.003	3.044	.803
Nurse-Midwives	19.805	.708	9.260	.902	33.293	.031	4.326	.977
TBAs	30.728	.162	28.077	.031	27.644	.118	7.776	.802
Female-relatives	25.079	.401	13.910	.605	41.325	.003	12.432	.412
NGO's	12.726	.970	14.435	.566	50.048	.000	27.852	.006
Women groups	17.272	.837	14.158	.587	63.209	.000	16.724	.160
Religious leaders	18.399	.783	21.817	.149	53.179	.000	23.943	.021
Television	28.204	.252	57.408	.000	70.243	.000	15.397	.220
Radio	28.403	.243	24.374	.082	43.199	.002	11.370	.497
Newspapers	20.608	.662	52.972	.000	47.806	.000	21.130	.020

Source: Field Data (2015) **Relationship is significant at 0.05 level.*

As Table 3 illustrates, there is a significant relationship between the age of the respondents and their mothers as sources of maternal health information with a Chi-square value of 54.567 and a significant value of < 0.001. This implies that, the women's use of their mothers as their sources of maternal health information was influenced by their ages. The finding that majority of the respondents were aged below 34 years (See Table 1) suggests that those

women who were younger depended on their mothers as their sources of maternal health information more than older women. The possible reasons behind this finding could be that the women wanted to learn from their mothers since they were more experienced than they were on various maternal health issues. Contrary to the present findings, a similar study in Kenya by Owino *et al.* (2014) found that age influenced pregnant women aged below 24 years to seek various maternal health information from professional healthcare workers in the antenatal clinic. This is because these women were more curious to know more about their pregnancy from the professional healthcare workers than older women whose more experienced in such pregnancy-related issues made them comfortable as they were.

On the other hand, the results presented in Table 3 indicate that there is no significant relationship between age and the other listed sources of maternal health information since the significant values for all of them were above 0.05. In other words, age did not have any bearing on the choice of these sources of information among women respondents.

With regard to education, results from the Chi-square analysis indicate a significant relationship between this variable and two sources of maternal health information: the television and newspapers with Chi-square values of 57.408 and 52.972, respectively. Moreover, each of these media had a significant value of $p < 0.001$. Findings from this study indicate that only a few respondents were likely to use these two sources of information as their sources of maternal health information (see Table 1). These findings signify that the women's use of these two sources of maternal health information was influenced by their levels of education. This can be explained by the fact that only a small proportion of the respondents had attained secondary and post-secondary education (see Table 1). The findings in this study confirm those of the previous studies such as Mbagaya *et al*. (2005) which also reported the influence of education on the utilisation of mass media sources of information such as television and newspapers.

Table 3 also shows no significant relationship between education and other listed sources of maternal health information such as spouse, mothers, mother-in-law, doctors, midwives, TBAs, female relatives, NGOs, women groups, religious leaders and the radio since the

significant values for all these sources were above 0.05. This finding implies that the women's choice on the use of these sources of information for their different maternal health information was not influenced by their levels of education. Nevertheless, only two sources of maternal health information—television and newspapers—were significantly related to the educational levels of the women respondents. This finding emphasises the role of education in influencing the choice of sources of maternal health information and in shaping the information-seeking behaviours of women in rural Tanzania. In fact, literature has established that low levels of education limits women's ability to access and understand health information from different sources of information, thus affecting their utilisation of maternal healthcare (Mboera *et al*., 2007; Malata & Chirwa, 2011). Therefore, it is important for information providers to take into account the levels of education of women when presenting them with different types of maternal health information.

Also a significant relationship was found between respondents' levels of income and sources of information such as doctors *(X^2 = 26.907, significant value p = 0.003)*, NGO's *(X^2 = 50.048, significant value p < 0.001)*, women's groups *(X^2 = 63.209, significant value p < 0.001)*, religious leaders *(X^2 = 53.179, significant value p < 0.001)*, television *(X^2 = 70.243, significant value p < 0.001)*, radio *(X^2 = 43.199, significant value p = 0.002)* and newspapers *(X^2 = 47.806, significant value p < 0.001)*. These findings imply that the women's choices regarding these sources of maternal health information were influenced by their levels of income. This means, those women with higher incomes were able to access these sources for their maternal health information more than those with lower incomes. Similar findings were also reported in Kenya by Silali and Owino (2016).

However, the finding that there was a significant relationship between the women's levels of income and sources of information such as NGOs, women's groups, and religious leaders was not expected. This is because access to these sources of information does not require one to have higher incomes. The significant relationship between women's groups as sources of maternal health information and the respondents' levels of income can be explained by the fact that most of these groups are associated with different economic activities that are geared towards empowering women economically (Koech, 2014; Waller, 2014). This finding appears to suggest that, the majority of the respondents were not members of these groups

and, thus, could not utilise them as sources of maternal health information. Evidence from past studies shows that, apart from helping women economically, women's groups also provide an opportunity for women to share different types of information that help them in their everyday decision-making (Waller, 2014).

On the other hand, the finding that there was significant relationship between sources of information such as doctors, television, radio, and newspapers and respondents income appears linked to access to these sources depending much on the levels of income of the women respondents. Those women who had higher income were better placed to have access to these sources of maternal health information than those with lower incomes. These findings are similar to those from previous studies such as Nilsson (2014) who reported that sources such as television, radio, and newspapers were perceived to be very expensive and a luxury and were largely owned and accessed by men or people in urban areas.

With regard to doctors being sources of maternal health information, it was established that although the government had declared free access to maternal and child healthcare services to pregnant women (MoHSW, 2003), most of the communities under review had no healthcare facilities in the vicinity. This lack compelled many of the women to travel over long distances to places where these facilities existed so that they could access professional healthcare. This necessitated them to pay for the fare to reach these healthcare facilities in neighbouring villages. In other words, those who could not afford to pay for transport resorted to other sources of information to satisfy their different maternal health information needs as a matter of necessity.

No significant relationship was found between the respondents' income and the other remaining sources of information such as the husband, the mother, the mother-in-law, midwives, female relatives, and TBAs. This means access to these sources of maternal health information was not determined by the women's levels of income because these were immediate family members of the pregnant women and, therefore, they were expected to provide free maternal health information to women so as to support them during the entire course of their pregnancy. As for the TBAs, even though their services might involve some

form of payment, normally this is negotiable and can also be paid in kind as reported in previous studies (Pfeiffer & Mwaipopo, 2013; Vyagusa *et al*., 2013).

With regard to the gestational age of the pregnant women involved in this study, Table 3 indicates that there was no significant relationship between this variable and all the sources of maternal health information listed since their levels of significance was above 0.05. This implies that pregnant women's use of these sources of maternal health information was not influenced by their gestational age. Indeed, although pregnant women involved in this study were at different stages of their pregnancies (see Table 1), they all sought information from the same sources of information.

6.0 Conclusion and recommendations

On the whole, the majority of the respondents affirmed that they were likely to utilise professional healthcare workers on all matters related to maternal health. Because of the shortage of professional healthcare they considered word-of-mouth (from relatives such as mothers, female relatives, and husbands) as vital sources of maternal health information. On the other hand, religious leaders, women's groups, NGOs, and mobile phones were the lowly used sources of information among respondents. Moreover, the mass media, particularly radio, continues to play an important role in delivering maternal health information for many women.

There is great potential for exploiting word-of-mouth networks. In fact, almost half of all respondents indicated relying on their immediate family members such as female relatives, spouses, and mothers to access maternal health information. This means, these have the potential to be important conduits for health information, particularly maternal health. The high level of importance that medical doctors, midwives, and word-of-mouth networks play in sharing information to rural women highlights how practitioners can integrate maternal health information into the existing public health dialogues. Health professionals must also be aware of not only that they are the key information providers in rural communities but also of the fact that they also need to be aware of the limited reach of some media platforms such as television and newspapers for the majority of the rural women.

Based on the findings of this study, it is recommended that, although public, private, non-governmental and religious institutions remained trivial sources of information among the respondents, such institutions can be integrated into the existing public health campaigns to foster information sharing practices.

The government and other health agencies or bodies concerned should provide necessary training to the existing CHWs and TBAs, impart them with some basic maternal health information and knowledge and employ them as health information providers in rural and remote areas. Information infrastructure such as community resource centres could be established and manned by CHWs to provide free information services on maternal health care to reduce the financial constraints associated with hospital visits as this would encourage more women to seek health information from CHWs and midwives. Moreover, the establishment of more primary healthcare centres can reduce the distance and time spent on seeking health-related information. Other avenues for promoting health information could involve using community radios, posters display in hospitals, schools and village community centres to increase women access to health information. The availability, access to and utilisation of maternal health information would, no doubt, translate into a safe delivery and healthy lifestyle for a woman during pregnancy, thereby reducing maternal mortality.

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