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Access to and use of nutrition information among pregnant women in Makete District, Tanzania

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Abstract

This paper presents the results of a study that was undertaken to investigate pregnant women's nutrition information needs and how these women access such information. The study used a descriptive research design to collect and analyse data from 80 pregnant women and 10 nurses from two healthcare facilities namely Makete District hospital and Ipelele Health Centre. Data were collected using a questionnaire survey which was administered to pregnant women. Focus group discussions were conducted to solicit the women's views about the topic in question, and interviews were conducted with the healthcare providers to solicit their perception about the women's nutrition information needs and how the women access such information. While content analysis was used to analyse qualitative data, descriptive statistics were used to analyse quantitative data with the help of IBM SPSS version 23. Findings from the study revealed that pregnant women had a number of nutrition information needs. These range from the need to be provided with nutrition information that will help them prepare the best diet during and after their pregnancy, to the type of supplementary nutrients to add to their diet, and how to best protect their food from contamination. The findings further show that to meet their different nutrition information needs, the women had to consult a variety of sources including healthcare providers, mass media sources, and their friends. However, of all the sources identified, nurses were the main sources that were utilized by many pregnant women. Despite showing interest in a number of nutrition information, this study's findings revealed that some pregnant women failed to make use of that information, thus putting themselves and their unborn babies at risk. The study concludes that nutrition information is vital for the health of pregnant women and their unborn babies. It is thus essential for pregnant women to access and effectively utilize such information to enhance their maternal outcomes.

Keywords: Nutrition, nutrition information, access to nutrition information, use of information, pregnant women, Makete District, Tanzania.
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Introduction

Malnutrition continues to be one of the greatest health challenges facing developing countries, including Tanzania (Khamis et al., 2020). Like other countries in the world, Tanzania has committed to ending this problem. Several initiatives have been put in place by both the Government of Tanzania and other

stakeholders to fight malnutrition and thus improve maternal health among pregnant women. The country's commitment to fighting malnutrition has been demonstrated by its support of the global Sustainable Development Goals (SDG), particularly goal 2 which aims at ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture (Grosso et al., 2020; UN, 2022). Other initiatives and strategies to address the problem of malnutrition in Tanzania include among others National Multi-sectoral Nutrition Action Plan (NMNAP) [2016 – 2021], Health Sector Strategic Plan IV (HSSP IV) [2016 – 2020], National Accelerated Investment Agenda for Adolescent Health and Wellbeing (2019 – 2022), Tanzania Agriculture and Food Security Investment Plan (2011 – 2022), Tanzania Food and Nutrition Centre Strategic Plan (2014 – 2018), and National Nutrition Social and Behaviour Change Communication Strategy (2013 – 2018) (USAID, 2021).

Notwithstanding these initiatives, nutrition deficiency among women of reproductive age remains a prevalent problem in Tanzania, particularly in the country's Southern Zone. A recent national nutrition survey (URT, 2019) indicates that although malnutrition decreased from 48% in 2005 to 41% in 2010 due to the various measures taken, the level increased again to 45% in 2015/2016. In Tanzania, poor nutrition is influenced by among other factors, a lack of access to nutrition information. Studies (e.g., Brenda, 2010) demonstrate that lack of access to nutrition information has led many women in the country to fail to determine how to prepare the right quality and quantity of food to eat during pregnancy such that they put both their lives and that of their fetus at risk. It is clearly understood that there is a mutual connection between pregnant women and their fetuses. As such when pregnant women are affected by nutritional problems, there is a likelihood that they are going to deliver children with the same problems. With regard to this, nutrition information is then very significant to pregnant women since these women are vulnerable to many diseases and such vulnerability puts their lives and that of their fetuses in jeopardy (UNICEF, 2019).

Access to nutrition information enables women to prepare accurate diet during their pregnancy to improve both their health and that of their unborn children. There is evidence from studies (Basmat, 2010; Uloma & Adedotun 2013; Garcia et. al., 2021) that well-informed women know how to prepare and take a balanced diet before, during, and after pregnancy to guarantee maternal fetal and newborn health. In other words, informed and healthy mothers are more likely to deliver healthy children as compared to those who are unformed, unhealthy, and with low nutrient levels that can put them at greater risk such as becoming anaemic during pregnancy which may result in excessive bleeding during child delivery. Furthermore, research (Williamson, 2006; Sunguya et al., 2021) shows that women who are not able to prepare a balanced diet during pregnancy are more likely to face severe deficiencies of iron, zinc, and folic acid which increases the risks of having low birth weights, and developing birth defects and pregnancy complications. Studies (e.g., Sunguya et al., 2021) have also reported an association between poor diet and maternal death among women pregnant in Tanzania.

While it is clear that access to and use of nutrition information is key in informing nutrition decision-making among pregnant women, there is paucity of studies to inform how these women, particularly in Makete District access and use such information. As such, making decision on how to help these women access and use relevant nutrition information in their decision-making processes is difficult. It is against this background that this study aimed to determine how pregnant women in this district access and use nutrition information. Specifically, the study aimed at identifying nutrition information needs among the pregnant women; ascertain sources of information the women used to access nutrition information; and to examine the usefulness of nutrition information among the pregnant women. This is essential as it will facilitate designing of strategies to help pregnant women to access and use relevant nutrition information for better maternal outcome. Findings from this study, therefore, may be used to inform interventions that can enhance nutritional habits and thus promote positive maternal outcome among pregnant women.

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Related Literature

Access to accurate nutrition information by pregnant women is vital for the health of both the women and their unborn babies. Such information helps to bring the knowledge gap between what the women know and what they do not know when it comes to preparing healthy diet both during and after their pregnancy. Nutrition information is needed by both pregnant women and healthcare providers to improve decision making in caring of pregnancies to ensure proper development of fetuses (Feistein et al., 2016, Clarke et. al., 2016). A well-informed pregnant woman is better positioned to know how to eat and how to prepare balanced diet (Uloma & Adedotun, 2013). It is, therefore, important that the nutrition information acquired by pregnant women cover all matters relating to important nutrients for their health and fetuses' development. Among others, the information should be able to help pregnant women to avoid nutritional related diseases (Felesia & Daka, 2018). Reporting on the nutrition information needs, studies (e.g., Feistein et al., 2016) have observed that women are more interested in nutrition information during pregnancy than before conception because that is when they start having concerns about their nutritional status hence looking for ways to obtain enough materials such as Iron, Iodine, and Vitamin A. Studies have also (see, for instance, Szwajcer et al., 2008) reported that among other health information, pregnant women also wanted to be provided with information to improve diet for their babies and types of food supplements for them to stay healthy during and after their pregnancy.

In the course of seeking information, people always interact with print sources such as newspapers, books, and magazines found in places like libraries, or computer-based information systems such as the website (Wilson, 2000). It is important to know the sources of nutrition information used in various communities and among different demographics since these sources can be used as effective tools to disseminate accurate nutrition information to the masses (Quaidoo et al., 2018). When seeking nutrition information, pregnant women tend to interact with different sources to meet their various nutrition information needs. Studies such as that Onuoha and Amuda (2013) revealed that there are countless sources of information that the women can use to access nutrition information. Such sources include among others books, magazines, videos, television, classes, pediatricians, friends, colleagues, traditional healthcare providers, and relatives.

Other similar studies (Sayakho, 2016; Carolan-Olah, 2016) have reported on how internet sources have become popular sources of information on pregnancy, fetal development, and nutrition. This popularity has been influenced by the ease and convenience with which information can be accessed online. As attested by Grimes (2014), preference in internet sources is a result of their reliability, time saving, and physical proximity as compared to other sources. However, other studies (Pandita & Sing, 2008; Hiddink, 2013) revealed that such popularity of these sources is mostly limited to educated women who have the ability to navigate the web and use the tools required to do so as compared to the illiterate.

Despite the popularity of electronic sources, print sources of information have been around and used by information seekers for many years and continue to play a great role in providing nutrition information even now (Heart Foundation, 2016). These sources have been reported to have the potential of reaching large number of community members including pregnant women compared to other sources of nutrition information despite the fact that their effectiveness depend much on individuals' level of education, income, and one's reading culture (Zelalem et al., 2017).

Effective usage of nutrition information is very important among pregnant women. The maternal information provided to parents will be effectively used if it has adequate content and easy to understand (Felesia & Daka, 2018). A study conducted in UK (Grunert et al., 2010) reported little difficult in understanding and using nutrition information among the general population. Most of the respondents

indicated to easily apply nutrition information in their nutritional decision-making processes. Another similar study by Wiles et al. (2009) also reported high usage of nutrition information in making nutritional choices among women respondents. However, it was reported in this study that such usage of nutrition information was much influenced by the women's level of education and being a head of the household. It was reported in this study that those women with tertiary education and who were head of their household were more likely to use the information as compared to their counterparts. With this observation, one can conclude that usage of nutrition information is a function of a multitude of factors as evident in other prior studies (Oni & Takur, 2012; Mwaisela & Mwantimwa, 2018). In these studies, other factors such as social cultural values, income, and language were also observed to influence usage of nutrition information among women.

Materials and methods

This study used descriptive research design employing a mixed methods approach with the purpose of investigating access to and use of nutrition information among pregnant women. The study was conducted at Makete District Hospital and Ipelele Health Centre in Makete District, Njombe Region, Tanzania. This district is one of the four districts of Njombe Region. The district was selected due to the fact that it is among the severely affected districts by chronic malnutrition among pregnant women at national level with alarming rate of 53.6% (URT, 2019). The study population comprised of pregnant women and healthcare providers (nurses) from the two selected healthcare facilities. The healthcare providers were included in this study so that they can provide their perceptions on the nutrition information needed by the women and on whether the women use the provided information in their decision-making processes. This was due to the fact that these healthcare providers were responsible for the provision of nutrition information to the women, so based on their experiences they were well positioned to know the nutrition information needs of the women in question.

The study used convenience sampling techniques to select 80 pregnant women who were involved in a questionnaire survey. Convenience sampling was used because it was noted that not all pregnant women were attending clinic on the same day. This technique was used until the intended sample size was reached. Furthermore, the study used purposive sampling technique to select 10 healthcare providers (six from Makete hospital and four from Ipelele health centre) as key informants. This technique was used because nurses were key informants in the study hence the need to purposively select those thought to be information rich on the study's objectives. Moreover, purposive sampling technique was used to select fourteen respondents for focus group discussion (FGDs) from the two healthcare facilities (seven from each). Apart from FGDs, data for the study were also collected through a questionnaire survey which were administered to the pregnant women, and interviews which were conducted to solicit the perceptions of the healthcare providers on the nutrition information needs of the pregnant women. Content analysis was regarded during analysis of qualitative data while descriptive statistics were generated from quantitative data by aid of Statistical Product and Services Solution (SPSS) program version 21. Data were presented in form of quotations, tables and figures as shown in the next section.

Study results

Demographic characteristics of the respondents

Overall, a total of 80 women participated in the study. The study's findings, as indicated in Table 1 revealed that most (85%) of these respondents were aged between 15 to 30 years old with only a relatively small number of them (15%) being above 30 years. Moreover, findings of the study revealed that majority of

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respondents were married (71.3%) and involved in small scale farming (70%) activities as main source of income. Additionally, a significant number of the respondents (62%) had lower levels of education and only a handful of them had attained a diploma (6.3%). More than a quarter (26.2%) of all respondents had an informal kind of education. Results further show that more than half of all respondents (56.2%) had an income that is below 2000 Tanzanian shillings per day.

Table 1: Demographic characteristics of the respondents (n=80)

Category	Frequency	Percentage
Age Group (Years)		
15-20	18	22.5
21-25	24	30
26-30	26	32.5
31-35	12	15
Marital Status		
Married	57	71.25
Single	18	22.5
Separated	5	6.25
Occupation		
Farmer	56	70
Small scale business	17	21.25
Employed in a formal sector	7	8.75
Education level		
No formal education	21	26.25
Primary	35	43.5
Secondary	11	8.8
Certificate	8	10.0
Diploma	5	6.25
Income (Tzs)		
Less than 1000	15	18.75
1001 – 2000	30	37.5
2001 – 3000	14	17.5
3001 – 4000	13	16.25
Above 4000	8	10

Nutrition information needs

Based on the responses received from the interviews, pregnant women in the area had a number of information needs. These ranges from the need to know how to plan and prepare healthy diets, if their diets were balanced, supplementary nutrients needed by their bodies, and how to safely keep their food. Even though pregnant women needed different kinds of nutritional information in the study area; the most needed nutritional information was on how to plan and prepare their food to ensure it is healthy. According to the responses provided, this need is of great importance among the pregnant women because majority of them failed to properly arrange and prepare meals in a way that will support their pregnancies. With regards to this, one of the key informants had the following information to share:

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> *One of the most important things that pregnant women need to know is how to plan their food intake. It is not unusual for us here to encounter a pregnant woman who says she fails to plan her daily meals. Majority of them reported that they usually eat one kind of food during the whole period of their pregnancy partly because they lacked knowledge on what, how much, and when to eat. However, their economic status contributed to all these since majority of them cannot afford* (Interviewee 3).

Apart from elaborating the needs for diet planning information, this narration has revealed that poor food consumption is not just an issue of lack of knowledge, but also a result of financial challenges forcing the women's food consumption to be unsystematic hence unhealthy. It is worth pointing out that lack of such knowledge puts pregnant women's lives and those of their expected children at risk as explained by one of the pregnant women from focus group discussion who had this to share:

> *Pregnant women's meals must include all necessary food groups because in addition to the normal nutrient requirements, the condition demands even more in different amounts. As a result, it is of great importance that diets should contain some vegetables, fruits, and various starch sources such as maize, potatoes, wheat, cassava, and rice* (FGD participant 2)

Let alone the issue of knowledge on how to plan and prepare the healthy food, it was also observed that pregnant women in the study area need information on supplementary nutrients. The respondents revealed that the pregnant women attended to the health centres were usually interested in knowing what additional nutrients they should take as explained by one interviewee, a nurse who had the following to say:

> *Once women become pregnant, they develop a tendency of looking for information on what nutrients they have to add to their diets and the supplement they have to take in order to get the nutrients. This is done with knowledge that doing so will help to keep them and their babies healthy. Among other things we advised them to take their intake of folic acid seriously so as avoid giving birth to babies with brain and spinal cord defects* (interviewee 7).

Results from the interviews further revealed that some women were not able to differentiate between eating too much of the same type of food and taking a balanced diet. The healthcare providers came to learn that some pregnant women did not understand the difference between eating a balanced diet and eating disproportional food. This suggested that the pregnant women needed information on how to eat healthy food in order to gain or maintain necessary body weights, avoid anaemia, and ensure proper development of their fetuses.

In this study, the women were also interested with information about food safety. The women were interested to know how to safely prepare and store their food such that it will not be contaminated. This need entail that the women needed information that will help them to ensure that their food is properly prepared and stored.

Access to nutrition information

The study was also interested to know whether the pregnant women had access to nutrition information or not to help them in their decision-making processes. Results, as indicated in Table 2 show that most of the

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respondents (84%) said that they have access to nutritional information while a few of them (16%) indicated not to have access to the information.

Table 2: Access to nutrition information

Response	Frequency	Percentage
Have access to nutrition information.	67	84
Have no access to nutrition information	13	16

Furthermore, results (see Table 3) show that most of the respondents who had no access to nutrition information (77%) came from Ipelele Health Center whereas the rest (23%) came from Makete District Hospital. This may suggest that the nature of the health facility may also contribute to the women's access to the needed nutrition information.

Table 3: Respondents who had no access from respective Institution (n = 16)

Health facility	Frequency	Percentage
Makete District hospital	3	23
Ipelele Health Center	10	77

Nutrition information sources

Having a majority of the respondents that had access to nutrition information as compared to the few that did not have access to such information, the study was also interested to know how these women access the needed information using different sources. Sources of nutritional information are important in accessing relevant information for pregnant women. Only respondents that said they had access to nutritional information were asked on the sources used to access the nutritional information. Results as indicated in Table 4 show that the respondents had access to multiple sources of nutrition information including healthcare providers (nurses and doctors), friends, mass media (radio and television), brochures, and internet. However, of all the identified sources, nurses were ranked high as they were the only sources of nutrition information that was used by a majority (71.6%) of the study respondents. Only a few (4.5%) respondents indicated to consult doctors for nutrition-related information. Nearly one-third (29.9%) of the respondents also indicated to consult their friends for various nutrition-related information.

Table 4: Nutrition Information Sources (n=67)

Nutrition information source	Frequency	Percentage
Nurses	48	71.6
Friends	20	29.9
Radio	16	23.9
Brochures	11	16.4
Internet	9	13.4
Television	5	7.5
Doctors	3	4.5

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The findings in Table 4 corroborate with those from FGDs which also revealed that many women get nutrition information directly from the nurses when they attend clinics. Explaining the reason for the heavy reliance on nurses to access nutrition information, one respondent said:

> *I do not have sources to access nutritional information except nurses who are always available to educate me on how to eat a balanced diet while I am pregnant* (FGD participant 1).

Although nurses were the main source for accessing nutrition information by pregnant women in Makete District, friends and radio were also mentioned as the mostly consulted sources of information. This was confirmed as one of the pregnant women said:

> *Even though we get most nutrition information from the nurses at the health facility, we also get some information from the radio. I understand that some of the information can also be obtained from television, but for my case, and because of the economy, I don't have a television so, I only rely on the radio as a source of nutrition information to supplement what I get from the nurses at the hospital* (FGD participant 5).

Another FGD participant had this to say:

> *The only media I use is the radio because I do not have a television set. My radio helps me to access the information I need. For instance, I tune on to Radio Kitulo every Thursday from 8:00 A.M to 10:00 A.M to listen to a weekly programme called Mama na Mwana (Mother and child) which has useful information for pregnant women. Apart from being affordable, the radio is manageable because I can carry it with me to the farm to avoid missing my favorite programmes* (FGD participant 2).

These narrations from the women respondents indicate that radio also plays a very important role in disseminating nutrition information to the women. As such, it is considered as an essential source of nutrition information by the women.

Perception on effectiveness of nutrition information sources

Apart from bringing to light the nutritional information sources used by pregnant women in the study area, the study also sought to ascertain their effectiveness in providing the information. The purpose was to find out if the sources used by pregnant women in the study area helped them to satisfy their needs. To do so, respondents were asked to rate the sources they used on a scale of 1 to 3 (where 1 = Very effective, 2 = Effective, and 3 = Not effective).

Findings, as shown in Figure 1 indicate that a significant number of respondents (70%) agreed that the sources they used to access nutrition information were effective and thus able to meet their various nutrition information need. This is opposed to only a few respondents (30%) who said that the sources where not effective and thus hardly meet their nutrition information need.

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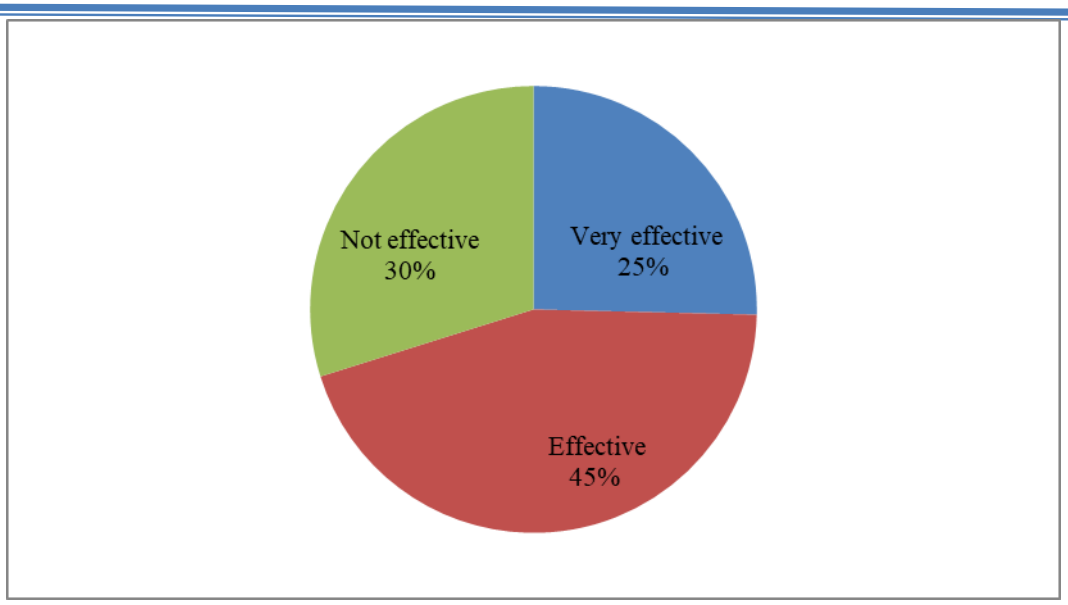

Figure1: Perception on Effectiveness of the Nutrition Information Sources

To get a clear picture of the effectiveness of individual sources of information, the respondents were then asked to rate these sources separately. Results, as demonstrated in Table 5 reveal that nurses were the most effective sources of nutrition information compared to all other sources mentioned. Nearly all respondents (88.1%) rated high the nurses as being the most effective sources of nutrition information. These were followed by friends who were also rated high by a significant number of respondents (67.2%). Of all the sources mentioned, doctors were rated as the most ineffective sources of nutrition information by nearly all women respondents (98.5%). This finding corroborates with the one in Table 4 which shows that doctors were the least accessed source of nutrition information compared to all the identified sources of information.

Table 5: Perception on effectiveness of individual information sources (n=67)

Source	Very effective		Effective		Not effective	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Doctors	-	-	1	1.5	66	98.5
Nurses	10	15	49	73.1	8	11.9
Television	-		2	2.9	65	97.1
Radio	2	2.9	25	37.3	40	59.7
Internet	2	2.9	10	15	55	82.1
Friends	25	37.3	20	29.9	22	32.8
Brochures	7	10.5	11	16.4	49	73.1

Usage of nutrition information

The study was also interested to find out if the women respondents use the acquired nutrition information. Results from the study (see Figure 2) indicate that more than half of all women respondents (55.2%) use the provided nutrition information to improve their diet during pregnancy. In contrast, a significant number of women respondents (44.8%) indicated not to put to use the acquired nutrition information.

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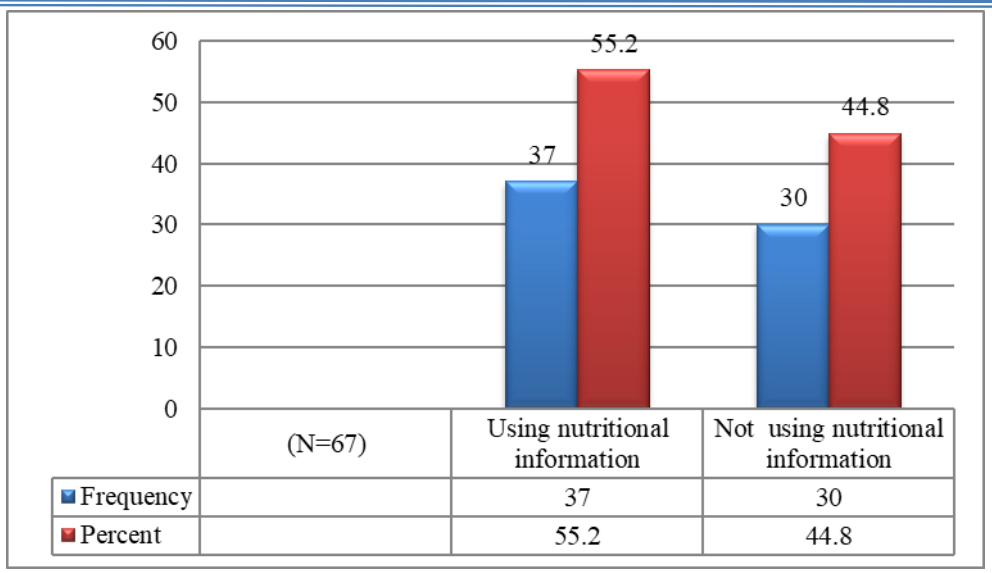

Figure 2: Usage of Nutritional Information

Explaining reasons as to why some women do not use the provided nutrition information, one respondent in a FGDs attributed this to a lack of knowledge on how to apply such information to improve their diet. The woman states that:

> *When I was pregnant, I preferred eating vegetables. I normally cook for at least fifteen minutes before they are ready for consumption*" (FGD participant 4).

This narration suggests that the women know that they are supposed to eat vegetables during pregnancy. However, they lack knowledge on how to prepare such vegetables so as to maintain nutrients. As such, the women end up eating food with insufficient nutrients as well as that with less than the recommended calorie intake. This finding was also confirmed by one of the healthcare providers who lamented that:

> *What we have noted is that although we instruct these women on how to apply the information, most of them do not do so. As a result, we are left wondering as to where the problem lies. Sometimes we think perhaps they do not understand when we teach them or maybe there are other reasons like inadequate fund* (Interviewee 2).

The narration from the healthcare provider suggests that a failure to apply the acquired nutrition information by the women respondents in this study may be a function of a multitude of factors, not only just a lack of knowledge on how to use the information. Poverty is also one among the factors contributing to low or non-usage of nutrition information amongst the studied women.

Results from the interviews further revealed that although service providers appreciated that some women consulted them with their questions and concerns about supplements their bodies needed, the information was not usually taken into account. For instance, they advised the women to take folic acid provided to them on a daily basis, when they asked them about that, their responses were always negative. According to the healthcare providers, the women could not use the supplements because when doing so they felt nauseated and sometimes vomit. Such a situation discourages usage of the provided supplements.

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Discussion

This study investigated how pregnant women in Makete district access nutrition information and whether they put to use the acquired information or not. Findings from the study revealed that a majority of studied pregnant women lacked knowledge on how to properly plan and prepare their meals in a way that supports their maternal outcome. As such, the women needed a number of nutrition information that could help them in improving their diet. The findings revealed that the women needed nutrition information that will help them know what to eat, when to eat, and how to eat before and during pregnancy. This findings are consistent with the one by Victora et al., (2016) who also noted that pregnant women need health and nutrition information so that they can know how to plan their meals. According to WHO (2014), a healthy meal (diet) must include variety of plant foods like vegetables, fruits, beans, potatoes, and pasta; accompanied by low fat milk and some cheese.

Additionally, the women in this study were found to express their need for information on how to eat healthy food in order to gain and maintain necessary body weights, avoid anaemia, and ensure proper development of their fetuses. Findings from the study revealed that the studied women failed to differentiate between eating too much of the same type of food and taking a balanced diet. As such, the need for information that could help them prepare and eat a healthy diet was essential. Prior studies (e.g., Wyatt & Da Silva, 2017) have stressed the need for provision of nutrition information that could help the women to put on the required weight during pregnancy. According to Wyatt and Da Silva (2017) women need to be provided with nutrition information that could help them add nutritious foods such as fruits, vegetables, healthy fats, and lean protein to their diets while abstaining from empty calories such as those found in soft drinks. It is a well-known fact that the life of a pregnant mother belongs to what she eats and that the quality of what she eats is more important than its quantity (Edris, 2006; Gunert, 2010). It is, therefore, essential that pregnant women are provided with this information so as to help them prepare proper meals for the betterment of both their own health and that of their unborn children.

Findings further revealed that the women needed information on supplementary nutrients. In this study, the women were found to understand the value of nutrients hence they were interested in knowing more about it. This finding suggest that the women knew what is required for them to be healthy during pregnancy as recommended by UNICEF (2019). According to UNICEF (2019), pregnant women are supposed to consume enough supplements of iron and vitamin D throughout their pregnancy. Findings from the study further demonstrate that the studied women were in need of information on food safety. This need covers methods that the women would use to ensure their food is properly prepared and stored. Food is supposed to be safe, whether it is consumed by pregnant women or not. Proper management of food helps to avoid risks of getting it contaminated and exposing consumers to food poisoning. It is therefore vital for the women to keep and prepare their vegetables, meat, fish, eggs, and other foods properly so as to prevent bacteria from contaminating them. The findings showed that the women under study need to be informed on handling, cooking, and storing of food so as to ensure it is safe. Prior studies such as that of Guneri (2007) have also established that eating a balanced diet and following expert advice on food safety are very important in ensuring safe delivery.

Pregnant women in this study were found to use multiple sources of information to access their needed nutrition information. These sources include among others healthcare providers, mass media sources, friends, brochures, and internet. However, findings from the study revealed that nurses were the highly used sources of nutrition information compared to all the other identified sources. High reliance on this particular source of nutrition information by these women can be attributed by factors such as availability and trust put to them by the women. As reported by Das and Sarkar (2014), pregnant women's choice of where to get information is influenced by the perceived trustworthiness of the source where it is believed that healthcare professionals are the most trusted sources of health information. Contrary to

Onuoha and Amuda (2013) who add that the most available and less costly sources to meet pregnant women's information needs are nurses and doctors. However, the findings in this study may be influenced by the fact that the study took place in hospital settings where the healthcare providers are easily available.

It was also observed in this study that the women under study used their social connections to get information that could help them in their nutrition related decision-making processes. In this study the women also get nutrition information from their friends to supplement what they have obtained from the healthcare providers. However, contrary to what has been observed in this study, other prior studies, particularly Mwaisela and Mwantimwa (2018) reported that the inadequacy of healthcare providers compel parents to rely on friends and relatives as sources of health information especially on pregnancy. However, it is not clear as to whether such sources provide relevant and accurate nutrition information or not.

Whilst it was found in this study that the women had access to multiple sources of information to meet their different nutrition information needs, findings demonstrate that the women lacked adequate knowledge on how to use it hence continued with poor preparation of their food. Findings showed that the respondents' prolonged cooking of vegetables leading to loss of some important vitamins rendering them not nutritious. According to FAO and WHO (2005) and WHO (2011) vegetables should be cooked by boiling for a maximum of three minutes to avoid vitamin loss and keep them nutritious. It was also observed in this study that despite being provided with nutrition information, especially on the uptake of supplements such as vitamin D and folic acid, the women in this study did not adhere to the provided information. Many women were not taking their vitamin D and folic acid as prescribed by their healthcare providers thus increasing the risk of becoming anaemic a situation that endangers both their own health and that of their fetuses.

Conclusion and recommendations

The findings confirmed that pregnant women understudy had multiple nutrition information needs. To fulfill those needs, they had to use multiple sources of information. However, since nurses were the main sources of nutrition information among pregnant women, they should ensure that these women and the surrounding community are imparted with knowledge and skills on how to apply such information for optimal use. With the increased application of this information, the health of pregnant women and fetuses will be significantly enhanced. This has to be done considering that many pregnant women with access to nutrition information did not make use of it while those who used, lacked adequate knowledge in applying the information. Appropriate utilization of nutrition information will help improve maternal health and fulfil the 2030 UN's sustainable development goals.

Like other studies, this study also had some limitations. First, the study was conducted in just two health facilities in one district. Therefore, its findings should be interpreted cautiously since they cannot not be generalized to other settings. As such, a large-scale study needs to be conducted to generate information on how pregnant women access and utilize nutrition information in enhancing both their own health and that of their fetuses. Secondly, in an attempt to identify the nutrition information needs of the pregnant women, only the perceptions of the healthcare providers were solicited. As a result, some nutrition information needs of the pregnant women might not be identified since the healthcare providers involved in the study, reported the nutrition information needs of the pregnant women based on their own experiences. Other studies should, thus, consider soliciting the views of the pregnant women themselves to get a clear picture of their nutrition information needs. Notwithstanding these limitations, the findings of the study shed light on the nutrition information needs of pregnant women and how these women access such information to inform their nutrition decision-making. These findings can be used by healthcare providers to improve provision of nutrition information to the women in question.

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