

## KNOWLEDGE, ATTITUDES AND PRACTICES OF WATER HYGIENE AMONG WOMEN ATTENDING ANTENATAL CARE IN BWARI AREA COUNCIL ABUJA

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### ABSTRACT

*This research investigated the Knowledge, Attitudes and Practices of Water Hygiene Among Women Attending Antenatal Care in Bwari Area Council of Abuja. The survey research design was adopted for the study. A population and well as simple size of two hundred and fifty pregnant women attending ante-natal care was used. To carry out the study, questionnaire forms were used in order to obtain relevant data from the pregnant women during antenatal care periods. The instrument was given to three experts in research, from the Department of Physical and Health Education who were not below the rank of senior lecturer. Their observations were used to correct the Questionnaire that later served as the instrument used for the study. This was pre-tested using 30 women attending ante-natal care who were not part of the main study. The split-half was used which yielded a co-efficient index of 0.78 that was considered high for the study. The data collected were analyzed using frequencies and percentages. The major findings were that; the respondents had knowledge that safe and ready water is important for public health 250(100%), improved water hygiene contributes to better standard of living 250(100%), water containers should be covered properly to avoid contamination 249(99.6%), access to safe water hygiene reduces morbidity and mortality from diarrhea 246(99.2%), and good water hygiene decreases negative health outcome at community level 246(98.4%). Others are lack of access to water in health care facilities compromises childbirth 244(97.6%), water should not be stored in a long period of time before use 235(94%), low amount of water will not clean the surrounding and body 233(93.2%), water source catchment should not be left unprotected and exposed 222(88.8%) and availability of water is necessary in primary health care 221(88.4%). Generally, the respondents had an average response of 95.9% which is an excellent level of knowledge of water hygiene, they had an average responses of 1.60 towards water hygiene which is positive attitude, they had good practices of water hygiene, their sources of water were wells and boreholes, they encountered no problems towards water hygiene. Based on this findings, it was recommended among others that antenatal mothers should be enlightened on the importance of using tap water to cook and clean and also drink bottle water or very clean water.*

### INTRODUCTION

Water is very necessary for human existence, it is used for human consumption, as well as economic purposes. Water is transparent, has no colour and smell and it is found all over the earth. It flows as liquid in rivers, streams, in the ground and oceans. People's accessibility to clean water is recognized as a human right. It is not surprising that the World Health Organisation (WHO) (2019) express that improving access to safe drinking water supplies may involve constructing or improving water supply systems or services such as provision of piped water on site, public standpipes, boreholes, protected dug wells, protected springs or rainwater. It should also involve risk assessment and management approaches, such as water safety planning, to ensure the success and sustainability of the improvement put in places hence, the knowledge of these is highly needed.

Describing knowledge, Sheth (2010) acclaimed that it is the body of information and understanding which individuals acquire through life experience and education. This then implies that any health action is dependent on the knowledge obtained. Applied to this study, knowledge is the ability to reproduce the memory, facts, recipes and so in related to water hygiene. Water hygiene knowledge therefore could be explained as the knowledge of providing general water services of preventive, promotive and rehabilitative nature to the population. Knowledge is critical to men's

quality of life because everything we do depends on knowledge. WHO (1996) asserted that knowledge is prerequisite for any health action.

Knowledge is the formation, skills and understanding that one has gained through learning or experience in line with these work, fact, information and skill acquired through experience or education and theoretical or practical understanding of water hygiene. Knowledge refers to the information, understanding, skills, and awareness acquired through learning, experience, observation, or study. In this it is the accumulation of facts, concepts, principles, theories, and practical know-how that individuals possess about various subjects or domains of water hygiene

McCarrell& Hamann (2020) explains that a strong interdisciplinary and wide spread foundation of water knowledge among all water users is a private goal towards achieving water sustainability and social water equality. Drawing from educational psychology water knowledge for an informed and engaged citizenry must also include; cognitive, affective/emotional and behavioral domains. This mirrors the learning goals set forth by the United Nation's Education for the Sustainable Development Goals (ESDGs) water literacy is therefore the combination of water related knowledge attitudes and behaviors; setting apart its importance uniqueness from other commonly used labels such as ecological or environmental literacy.

From the individual and collective action, Ministry of Health and Medical services, Solomon Island (2021) posited that all the people have the right to safe water and sanitation in urban areas in the Solomon Island access to improve water and sanitation was reported among 73% and 81% of households respectively, Water, Sanitation and Hygiene (WHO, 2015). But it is still a major challenge in rural communities where about 80% of the population live indeed, 54% of rural household had access to proper sanitation (WHO 2019). Open defecation is common hand washing with soap after defecation or before eating or handling food, was only practiced by 16% of the population. Inadequate water sanitation and hygiene contribute to the privative of infectious diseases such as diarrhea, skin diseases and respiratory diseases in 2018. Poor access to water supply sanitization and hygiene was the highest cause of death in the Solomon Island this means that every week 4-5 people died from it. This may be the situation in the area of the study.

As described by Ministry of Health and Medical Service (MHMS) Solomon (2021) water is transparent with no colour and smell and it is found all over the earth. They expressed that water is used to maintain body temperature, transport nutrients and get rid of toxins (body poisons). About 60% of a human's body is made of water, to stay health. In the swim vain, Montgomery (2002) pointed out that water is an essential element of life and it constitute 55% - 65% of a person's body weight, making it the most common element in the body. Water needs to be taken throughout the day because the body cannot produce enough on its own. Intake of fluids should approximately equal output. Adults lose between 1450 to 2800ml each day from insensible (immeasurable) and sensible (measurable) losses. Insensible water losses include evaporation from the skin and exhalation. Sensible water losses include urine and stool excretion water losses are approximately equal between sensible and insensible.

Explaining knowledge in relation to what the hygiene and pregnancy Solomon Island [2021] posited that all pregnant women have the right to save water and sanitation. In urban areas in the Solomon Island access to improve water and sanitation was reported among 73% and 81% of household respectively (WHO, 2019). McCarrol and Hamann (2020) explains that strong interdisciplinary and widespread foundation of water knowledge among all pregnant women is a pivotal goal towards achieving water sustainability and social water equality. Poor water hygiene knowledge among pregnant women leads to unhygienic practices and poor attitudes which pollute water and spread illness.

Attitude as described by Ineoglu (2010), as the mental, emotional, and behavioral tendencies of people organized with regard to experience, knowledge, emotion and response to a particular situation in a particular time frame. They can either be positive or negative. Attitude is been defined as a set of emotions, beliefs and behavior toward a particular object, person, things or event, in this case the behavior towards water hygiene by pregnant women. In line with this, Oxford Dictionary

described attitude as the opinions and feeling that you usually have about something, especially when this is shown in one's behavior: Attitude in this work is used to mean the likes and dislike of individuals or pregnant women towards water hygiene.

According to the Stephenson (2002), attitude is the way you think, feel and behave and behave about something, in this case attitude towards water hygiene, despite the knowledge, that dirty hands play a significant role in the spread of health-related pathogens, and that hand hygiene (HH), decreases the spread of these organisms, healthcare workers adherence with hand hygiene is poor. The findings of previous studies revealed that access to safe drinking water and improved hygiene are important for reducing morbidity and mortality from diarrhea. A survey of 330 pregnant women who participated in antenatal clinic-based intervention in Malawi showed that, promoted water treatments and hygiene, distribution of water storage containers, sodium hypochlorite water treatment solution, soap and educational message program, participants were more likely to know the correct water procedures (62% versus 27%), chlorinate drinking water (61% versus 1%), demonstrates correct hand washing practices (65%, versus 22%) and purchase water treatment solution after free distribution (32% versus 1%). The situation may not be different in the area of present study.

Practice according to Gashy (1995) is the activities that one does regularly and repeatedly to become very conversant with. Furthermore, practice refers to acquiring a set of value, feelings of concern of the environment of motivation for actively participating in the environment improvement and protection (Momoh & Oladebeye, 2010), in this case water hygiene practice during pregnancy. Poor hygienic practices, inadequate water supply and poor sanitary conditions play a major role in the spread of infectious diseases. General fluid needs increase during pregnancy in order to survive fetal circulation, amniotic fluid, and a higher blood volume. The current recommendation for water intake is drinking 8-10 glasses of water each day. In addition to maintaining fluid volume needs, most municipal water contains fluoride, which can aid the development of teeth and bones in the growing fetus (Henderson & Lenders, 1999). However pregnant women must be cautioned that some water is tainted with lead, which can result to spontaneous abortion, decreased stature, and deficiency in the neurodevelopment of the growing foetus.

A community-based cross-sectional study was conducted from June to July 2018. Multistage cluster sampling technique was used to collect data from 759 households in Tigray region, Northern Ethiopia. A standardized questionnaire was used to collect results on practice on water, sanitation, and hygiene. The response rate was 99.6%, and 574 (75.9%) of the respondents were females. Good knowledge, favorable attitude, and good practice on WASH were observed in 42.2% (95% CI: 38.7%, 45.7%), 48.5% (95% CI: 44.9%, 52.0%), and 49.2% (95% CI: 45.6%, 52.7%) of the respondents, respectively.

Observation seems to suggest that the knowledge, attitude and practice of water hygiene amongst women receiving anti-natal care in Bwari Area council is relatively poor as they do not pay good attention to kind of water they drink women receiving anti-natal care especially in Health care facilities in Bwari Abuja have also been observed to call in sick with the case of typhoid as a result of taking bad water even after they are being told during the anti-natal session to take very clean water for the sake of their health and that of the fetus.

It is known that water is very beneficial to humans in various ways, water helps to keep a normal temperature, to lubricate and cushion joints, protect your spinal cord and other sensitive tissues and help to maximize physical performance. It aids in digestion, prevent constipation, helps to absorb nutrient, improve blood oxygen circulation, helps fight off illness, boost energy, aids in cognitive function and prevent overall dehydration. About 70% of our body contains water so it is pivotal for the human race to survive, helps in excreting waste from the body through sweat, urination and defecation.

However, it is known that many people in so many countries are drinking water containing excessive levels of arsenic, long-term exposure to high levels of arsenic in drinking water and food can cause skin lesion and cancer. It has also been associated with cardiovascular disease and

diabetics. In utero and early childhood exposure has been linked to impaired cognitive development and increased deaths in young adults.

Furthermore, in health care facilities, inadequate water hygiene conditions have negative impact on staff, patient health care-seeking behavior and their overall health care experiences. Poor water hygiene in health facilities deters patients, particularly pregnant women from seeking care, also patients and staff are often placed at additional risk of infection and disease when water sanitation and hygiene services are lacking. If this situation is allowed to continue as it is, it is possible that majority of the people do not have good knowledge about water and its uses, it might lead to more sick and dead individuals in the society. Hence, the present study on the knowledge, attitude and practice of water hygiene among women attending anti-natal care in Bwari Area Council Abuja.

## RESEARCH QUESTIONS

To provide a guide to the study, the following research questions were stated

1. What is the level of knowledge of water hygiene amongst women attending anti-natal care in Bwari Area Council?
2. What are the attitudes of women attending anti-natal care towards water hygiene in Bwari Area Council?
3. What are the practices of water hygiene amongst women attending anti-natal care in Bwari Area Council?
4. What are the sources of water available in Bwari Area Council for women attending anti-natal care?
5. What are the problems encountered by the women attending anti-natal care towards water hygiene in Bwari Area Council?

## METHODS

The research design adopted for the purpose of this study is the survey research design. A population of two hundred and fifty (250) pregnant women attending ante-natal care at the time of the study was used. The whole population was used as the sample size.

The instrument for the study was a self-structured questionnaire designed to collect information from the respondent on the knowledge, attitude and practices of water hygiene among women attending antenatal care in Bwari Area Council Abuja, FCT.

There were five (5) sections in the instrument, section A has ten (10) statement eliciting information on knowledge of water hygiene among women receiving anti-natal care, section B has 13 statement which sort for information on the attitudes of women attending antenatal care towards water hygiene, section C has 7 statement which sort for information on the practices of water hygiene among women attending anti-natal care, section D has 6 statement eliciting data on source of water available to the women attending anti-natal care, section E has 8 statement which sort to find out the problems associated with water hygiene among women attending antenatal care.

The questionnaire for the study was validated by three experts that were not below the rank of senior lecturer from the department of Physical Health Education in Faculty of Education University of Jos. Copy of the draft was given to each of them for the purpose of face and content validation, appropriateness of the items clarity, and whether or not the items are related to the subject under study. Necessary corrections and observation were duly made as suggested by the experts. The observations done by the experts were duly followed and corrected, which gave rise to the instrument that was used for the collection of information of the study. Thirty (30) antenatal women were used to try test the instrument who were not part of the main study. The data obtained were coded and analyzed using Cronbach-alpha method to test for internal consistencies of the instrument. It was done using split half method for reliability test and a reliabilities co-efficient of 0.78 was obtained, this indicated that the instrument was reliable and was used for the main study. Frequency

and percentages were used in analyzing the data that was obtained and was used in answering the research Question.

#### KEY TO KNOWLEDGE

Below 40% Very Low Level of Knowledge (VLLK)

40 – 45% Low Level of Knowledge (LLK)

46 – 50% Average Knowledge (AK)

51 – 55% Above Average Knowledge (AAK)

56 – 60% Good Average Knowledge (GAK)

61 – 69% Very Good Knowledge (VGK)

70% and above Excellent Knowledge (EXC)

Table 1: Level of knowledge of water hygiene amongst women attending antenatal care.  
N= 250

| S/N | ITEMS                                                                      | CORRECT<br>ANSWER | INCORRECT<br>ANSWER | DECISION ON<br>OF LEVEL | f    | %   | f | % | KNOWLEDGE |
|-----|----------------------------------------------------------------------------|-------------------|---------------------|-------------------------|------|-----|---|---|-----------|
| 1.  | Safe and ready water is important for public health.                       | 250               | 100                 | 0                       | 0    | Exc |   |   |           |
| 2.  | Improve water hygiene contribute to better standard of living.             | 250               | 100                 | 0                       | 0    | Exc |   |   |           |
| 3.  | Low amount of water will not clean the surrounding and body.               | 233               | 93.2                | 17                      | 6.8  | Exc |   |   |           |
| 4.  | Access to safe water hygiene reduce morbidity and Mortality from diarrhea. | 248               | 99.2                | 2                       | 0.8  | Exc |   |   |           |
| 5.  | Water containers should be covered properly to avoid contamination.        | 249               | 99.6                | 1                       | 0.4  | Exc |   |   |           |
| 6.  | Water should be stored for a long period of time before use.               | 235               | 94.0                | 15                      | 6.0  | Exc |   |   |           |
| 7.  | Water source catchment should be left unprotected and exposed.             | 222               | 88.8                | 28                      | 11.2 | Exc |   |   |           |
| 8.  | Availability of water is not necessary in primary health care.             | 221               | 88.4                | 29                      | 11.6 | Exc |   |   |           |
| 9.  | Good water hygiene decreases negative health outcome at community level.   | 246               | 98.4                | 4                       | 1.6  | Exc |   |   |           |
| 10. | Lack of access to water in health care facilities compromise child.        | 244               | 97.6                | 6                       | 2.4  | Exc |   |   |           |

The result in table 1 shows that the respondent has knowledge that safe and ready water is important for public health 250 (100%) improved water hygiene contribute to better standard of living 250 (100%) water container should be covered properly to avoid contamination 249 (99.6%) access to safe water hygiene reduces morbidity and mortality from diarrhea 248 (99.2%) and good water hygiene decreases negative health outcome at community level 246 (98.4%). Others are lack of access to water in health care facilities compromises childbirth 244 (97.6%), water should not be stored in a long period of time before use 235 (94%) low amount of water will not clean the surrounding and body 233 (93.2%), water source catchment should not be left unprotected and exposed 222 (88.8%) and availability of water is necessary in primary health care 221 (88.4%).

Generally, the table shows that the respondents had an average response of 95.9% which is excellent knowledge in all the items.

Table 2: Attitudes of women attending antenatal towards water hygiene  
N= 250

| S/N | ITEMS                                                        | DECISION               |
|-----|--------------------------------------------------------------|------------------------|
| 1.  | I love to wash my hands after defecation.                    | 1.78 Positive attitude |
| 2.  | I love to wash my hand before handling food.                 | 1.76 Positive attitude |
| 3.  | I love to have enough water in my household.                 | 1.82 Positive attitude |
| 4.  | I prefer staying hydrated.                                   | 1.82 Positive attitude |
| 5.  | I like to know my source of water.                           | 1.89 Positive attitude |
| 6.  | I love to organize and participate in water source clean up. | 2.00 Positive attitude |
| 7.  | I love to dispose trash close to water source.               | 1.53 Positive attitude |
| 8.  | I do not like having clean water available always.           | 1.60 Positive attitude |
| 9.  | I love using tap water to clean and cook.                    | 1.92 Positive attitude |
| 10. | I love using enough water in health care facilities          | 1.90 Positive attitude |
| 11. | I love seeing low amount of water in health care facilities  | 1.53 Positive attitude |
| 12. | I love easy access to clean water.                           | 1.82 Positive attitude |
| 13. | I love using little amount of water to clean the household   | 1.60 Positive attitude |

The result in Table 2 shows that, I love to dispose trash close to water source (1.53), I love seeing low amount of water in health care facilities (1.53), I do not like having clean water available always (1.60), I love using little amount of water to clean the household (1.60) and I love to wash my hands before handling food (1.76). Others are I love to wash my hands after defecation (1.78), I love to have enough water in my household (1.82), I prefer staying hydrated (1.82), I love easy access to clean water (1.82), I like to know my source of water (1.89), I love using enough water in health care facilities (1.90), I love using tap water to clean and cook (1.92), and I love to organize and participate in water source clean up (2.00).

Generally, the Table shows that the respondents had an average response of 1.60 which is positive attitudes in all the items.

Table 3: Practice of water hygiene amongst women attending antenatal care.  
N= 250

| S/N | ITEMS                                           | YES |      | NO  |      |
|-----|-------------------------------------------------|-----|------|-----|------|
|     |                                                 | f   | %    | f   | %    |
| 1.  | Using containers to keep all household water.   | 250 | 100  | 0   | 0    |
| 2.  | Use clean water containers always.              | 250 | 100  | 0   | 0    |
| 3.  | Fill water straight from the tap.               | 232 | 92.8 | 18  | 7.2  |
| 4.  | Keep water containers at appropriate dry place. | 247 | 98.8 | 3   | 1.2  |
| 5.  | Use boiled water for always.                    | 114 | 45.6 | 136 | 54.4 |
| 6.  | Boil water for about 5-10 minute to kill germs  | 80  | 32   | 170 | 68   |
| 7.  | Filter the boiled water                         | 45  | 19.2 | 202 | 80.8 |

The result in table 3 revealed using clean containers to keep all household water 250 (100%), use clean water containers always 250 (100%), keep water containers at appropriate dry places 247 (98.8) and fill water containers straight from the tap (92.8); however, the table also showed that the women do not filter boiled water 202 (80.8%), boil water for about 5-10 minutes to kill all germs 170 (68%) and use boiled drinking water always 136 (54.4%), were the practices of the women attending antenatal care.

Table 4: Source of water of women receiving antenatal care.  
N= 250

| S/N | ITEMS    | YES |      | NO  |      |
|-----|----------|-----|------|-----|------|
|     |          | f   | %    | f   | %    |
| 1.  | River    | 40  | 16   | 210 | 84   |
| 2.  | Stream   | 34  | 13.6 | 216 | 86.4 |
| 3.  | Lake     | 33  | 13.2 | 217 | 86.8 |
| 4.  | Spring   | 34  | 13.6 | 216 | 86.4 |
| 5.  | Well     | 190 | 76   | 60  | 24   |
| 6.  | Borehole | 245 | 98   | 5   | 2    |

The result in Table (4) shows that the source of water available to the women attending antenatal care are Boreholes 245 (98%) and well 190 (76%).

Table 5: Problems encountered by the women attending antenatal care.  
N= 250

| S/N | ITEMS                                                       | YES |      | NO  |      |
|-----|-------------------------------------------------------------|-----|------|-----|------|
|     |                                                             | f   | %    | f   | %    |
| 1.  | Absence of water service                                    | 32  | 12.8 | 218 | 87.2 |
| 2.  | Treatment resisting bacteria                                | 17  | 6.8  | 233 | 93.2 |
| 3.  | Open defecation                                             | 30  | 12   | 220 | 88   |
| 4.  | Inadequate water Service                                    | 47  | 18.8 | 203 | 81.2 |
| 5.  | Lack of good water storage                                  | 58  | 23.2 | 192 | 76.8 |
| 6.  | Inadequate management of waste water                        | 30  | 12   | 220 | 88   |
| 7.  | Unavailability of safe water                                | 32  | 12.8 | 218 | 87.2 |
| 8.  | Inadequate accessibility of water in health care facilities | 47  | 18.8 | 208 | 81.2 |

The result in Table 5 revealed that most of the women said No to the following: Treatment resisting Bacteria 233(93.2%), Open defecation 220 (88%), Inadequate management of waste water 220(88%), Absence of water service 218 (87.2%) and Unavailability of safe water 218 (87.2%). Others are inadequate accessibility to water in health care facilities 208 (81.2), inadequate water service 203 (81.2%) and lack of good storage of water 192 (76.8%). This was so because all the statement were stated in negative forms, which means that these were not problem to the majority of the respondents.

## DISCUSSION

The result in Table 1 shows that the respondent had an average response of 95.9% which is an excellent knowledge in all the items. This result was not surprising because majority of the respondent were educated and hence, the result to verify this. This is in line with what Fuebriel (2005) who expressed that strong inter disciplinary and wide spread foundation of water knowledge among all water users is a pivotal goal towards achieving water sustainability and social water equity drawing from educational psychology, water knowledge for an informed and engaged atzenory must also be cognitive affective/emotional and behavioral domains. This mirrors the learning goals set forth by the United Nations Education for the Sustainable Development Goals (ESDGs). Water literacy is therefore the culmination of water related knowledge, attitude and behaviors, setting apart it importance and uniqueness from other commonly used labels such as ecological or environmental literacy. The use of water literacy is increasingly popular but the concept's definition, application and assessment differs substantially across each use. Thus this entry details a systematic review and synthesis of available literature to develop a holistic framework literacy element which can serve as a foundation for future study and application of water literacy efforts.

Generally, the result in Table 2 shows that the respondents had a mean score of 1.60 which indicated that they had positive attitude towards water hygiene in all the items, this result was

expected as majority of respondents were educated and hence the result to verify this. This is in line with the study by (WHO 2019) stressed that the availability of water services especially in maternity and primary health care setting where they are often absent support care unversed health care aspect of quality, equity and dignity for all people. Basic water service in health care facilities are fundamental to providing quality care and ensuring that primary health commitment is achieved. It can also improve health outcomes at the community level. More than one million deaths each year are associated with unclean birth while infections account for 20% of antenatal death and 10% maternal mortality. Most of these deaths are concentrated in low and middle income countries where the rate of health care associated infections (HCAI) are twice of that high income countries an estimated 15% of patients in low and middle-income countries develop one or more infection during a hospital stay. Although not all the HCAI can be traced to inadequate water service, evidence shows that lack of access to water in health care facilities may significantly compromise safe childbirth and access to primary health care. Inadequate water hygiene in health care facilities has been linked to the spread of antimicrobial resistant infections, placing patients and staff at risk of serious infections that are hard to treat. At the same time countries and subnational settings where WASH is inadequate and infectious disease risk are high, prophylactic use of antibiotic is more common which further drives the emergence of AMR. AMR is a major factor determining clinical unresponsiveness to treatment to treatment and rapid evolution to sepsis-related neonatal death that occurs worldwide each year may be attributed to resistant pathogens. Furthermore, unsafe disposal of waste water can contribute to the spread of AMR in the environment and communities.

The result in Table 3 shows that the respondent had good practices towards water hygiene, however, the table also showed that most of the women did not boil drinking water, filter drinking water and boil water for 5-10 minutes to kill the germs. This result surprising because every family is supposed to have clean water always and boil and filter water before drinking in line with what (Shields 2021) gave as guideline on how to keep our water clean by always using a clean container to keep all household water, clean water containers properly with (hot) water and soap, fill water containers properly straight from the tap use proper lid to cover containers to stop mosquitoes breeding and dirty from entering, keep water container at appropriate (cool dry) place to avoid contamination by dust animal and children, do not keep stored water for a long time in the house (Shields 2021) also gave guidelines on how to treat drinking water as follows: By boiling of water for about 5 minute in order to kill most of all germs living in the water, filtering of water; the clean water on tap passes through filters composed of sandy gravel, and charcoal to remove dissolved particles such as dust parasite, bacteria, viruses and chemicals, solar treatment (cleansing) of water; solar or sun water treatment (cleaning) is also one of the effective means for purifying water before drinking. Fill into transparent plastic or glass containers and put it directly to the sun light for 6 hours. It is important to make sure that each household has enough clean water all the time when there is adequate or enough water supply of water, use a good amount of water to clean the surrounding facilities and house but to save enough for emergencies and the following days. Where there is shortage or not enough water, use only a minimum amount of water but do make sure to maintain good personal and environmental hygiene. Water resource management according to (Shields 2021) is very important for agriculture, care of water at home and the community to minimize risk of water shortages we must look after our water bodies from future pollution and misuse. Make sure people do not pour petrol, diesel or oil into the river and throw trash into the water. It is very important that water resource is kept away from sanitation systems domestic animals, rubbish dumpsite and bury it in order to be free from contamination water resources facilities such as tanks, water pipes quitters etc. are checked regularly and maintained properly.

The result in Table 4 revealed that boreholes and wells are the source of water available to these women this is not surprising because majority of the respondents are educated and hence the result to verify this. This is because all these sources of water were available almost everywhere this is in line with what (WHO 2019) who expressed that source of water refers to the bodies of water such as the following. Rivers, Stream, Lakes, Reserves, Springs and Groundwater (Borehole), that



provides water to the public drinking waters and private wells. Water sources can include: surface water, groundwater, recycled water. The water flowing from tap may come from hundreds of miles away, public water system is most often supplied by surface water or groundwater. Large cities and towns usually get their water from surface water supplies or a mix of surface and groundwater supplies. Some small rural communities rely solely on ground water supplies which may or may not require treatment to meet drinking water Standards. If you do not get your water from a public water system, you most likely have a private ground water well. If your home is not connected to a public water system and you do not have a ground water source, you may get your water from a rain water collection system. In many areas of the world, people collect and use rain water as their drinking water source.

The results in Table 5 showed that there were no problems to the majority of the respondents, this was not surprising as majority of them were educated and hence the result. However, the statement by UNICEF (2011) expressed that safe water is pre-condition for health and development and a basic human right yet it is still denied to hundreds of millions of people throughout the developing world. Water related disease caused by insufficient safe water supplied coupled with poor sanitation and hygiene cause 3.4 million deaths a year, mostly among children. Despite committing efforts by government, civil society and the international community over a billion people still do not have access to improved source in developing countries. The scale of the problem of water quality is even larger, it is increasingly clear that many of the existing improved sources in developing countries do not provide water of adequate quality for domestic purposes. A well-known example of this is the extensive contamination of tube wells with naturally occurring arsenic in Asia. As serious as this and other cases of contamination, especially from feces. While ground water is generally of much high micro biological quality than surface water, an increasing number of sources and systems used by people for drinking and cooking water are not adequately protected from faecal contamination. This is due to variety of factors including population pressure, urbanization and the inadequate construction; operation and maintenance of water systems even fully protected source and well managed systems do not have safe water which is delivered to households.

The majority of the world's people do not have reliable household water connection and many of these must still physically carry over water collected from safe source is likely to become facially contaminated during transportation and storage safe sources are important but it is only improved hygiene, better water storage and handling, improved sanitation and in some cases, household water treatment that the quality of water consumed by people can be assured. The consequences of poor water quality go beyond health. Chronic bouts of water related diseases impose significant social and economic burdens on victims themselves and society as a whole. Poverty alleviation and the other millennium development goals will be difficult to achieve without improvement in water quality.

## **CONCLUSION**

Based on the findings of the study, it was concluded that the respondents had excellent knowledge, positive attitudes towards the practice of water hygiene and not facing any serious health problems relating to water hygiene practices.

## **RECOMMENDATIONS**

1. The statement that majority of the women "boil and filter water before drinking" had very low percentage, this be noted by health personnel so that they can organize workshop and seminars as well as the use of film for enlightening antenatal mothers on the importance of boiling and filtering water before drinking and also the danger of not boiling and filtering their water before drinking.
2. Based on the response that majority of the woman use well water to clean, cook and also drink it should be noted by the health care service providers so that they can enlighten antenatal mother and provide one on one counselling, health talks, workshops and seminars use panel discussion

during antenatal care on the importance of using tap water to cook and clean and also drink bottle water or very clean water.

3. The statement that Bwari Area Council lacks good storage of water facilities be noted by the department of health of the Area Council and they should provide public enlightenment to various communities in the Area Council. There should be provision of boreholes with good storage facilities based on population of each community they can equally seek for support from individuals and international communities.

## REFERENCES

- Ash,. Belt (2004). *Millennium development goals and the water target Details definition and debate*.
- Fawtrell,. R. (2005). *Water, sanitation and hygiene interventions to reduce diarrhoea in less developed countries: a systematic review and meta-analysis*.
- Gasby, A. (1995). *Shallow Water Hydrothermal Vents in the Gulf of California: Laboratories for Multidisciplinary Research*.
- Henderson, R. Lenders, P. (1999). *Nutrition in pregnancy and Lactation*. In.G. Morrison and L. Hark (Eds), *medical nutrition and disease* (2<sup>nd</sup> ed; pp. 61-75). Maiden, MA: Blackwell science.
- Ineoglu, A. (2010). *Goal Orientation and Perceptions of the motivational climate in physical education classes among Colombian students*. *Teaching and teacher education*. 24(6), 1441-1449.
- Mc Carroll, R. Haman .S. (2020). *What we know about water. A water literacy Review water 2020*. 12, 2803, 10.3390/w12102803.
- Montgomery, R. (2020). *An update on water needs during pregnancy and beyond*.
- Sheth, R. (2010). *Impact of the integration of water treatment and handwashing incentives with antenatal services on hygiene practices of pregnant women in Malawi*. *American journal of tropical medicine and hygiene*.
- Shields, E. (2021). *Fostering community participation in rural water supplies*.
- Solomon, (2021). *Water supply, Sanitation and Hygiene*. Ministry of Health and Medication service.
- Stephenson, T. (2002). *Cytogenetic analysis of miscarriages from couples with recurrent miscarriages: A case control study*.
- UNICEF (2011). *World Water Day: Highlighting the international year of sanitation*.  
<http://www.worldwaterday.org/>
- WHO (1996). *The World health report: 1996: fighting disease, fostering development / report of the Director General*. World Health Organization.  
<https://apps.who.int/iris/handle/10665/36848>
- WHO (2019). *Wash in Health Care Facilities*. Global Baseline Report.