Journal of Medicine, Nursing & Public Health

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ISSN: 2706-6606

Stratford Peer Reviewed Journals and Book Publishing
Journal of Medicine, Nursing & Public Health
Volume 4||Issue 1||Page 25-45||March||2021|
Email: info@stratfordjournals.org ISSN: 2706-6606

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How to cite this article: **Ahmed, M. A. (2021). Cancer Prevalence in Wajir County, Kenya: Estimation Using Cancer Data at the Healthcare Facilities. *Journal of Medicine, Nursing & Public Health*, 4(1), 25-45.**

Abstract

In Kenya, Cancer is the third highest cause of mortality (7% of deaths per year), after infectious diseases and cardiovascular diseases. Cancer diagnosis and treatment is facing serious challenges in Kenya where the treatment facilities are inadequate, unavailable or ill equipped. The cancer prevalence and burden in Wajir County, Kenya is largely unknown since there are no records, studies or information available. The purpose of this study was therefore to estimate cancer prevalence in Wajir County based on the cancer data available at the healthcare facilities in the County. The study was guided by the following specific objectives; to estimate the prevalence rates of cancer in Wajir County based on demographic characteristics; to identify the prevalent cancer cases and their types in the area and to examine trends in cancer prevalence over the period 2014 to 2019. This study used quantitative method approach to collect and analyze the data. Facility-based retrospective record review was employed to estimate the prevalence of cancer in Wajir County between 2014 and 2019. The target population included all the cancer patients served between 2014 through 2019 at all the health facilities in all the six sub counties in Wajir County. This study used secondary data collected by reviewing cancer patients' records at the facilities. The quantitative data obtained from the records was analyzed by descriptive statistics using SPSS version 25.0. Results were presented on tables, charts and bars. The findings revealed that the

recorded cancer cases were more prevalent among women (50.20%) than men (49.80%). Regarding age distribution, the study found that most (23%) of the patients were aged between 51-60 years, 20.3% were aged between 61-70 years, 12.5% were aged between 41-50 years, while 4.4% were aged between 10-20 years. The findings indicated that only 1.2% of the cases were aged at least 90 years. In terms of prevalence, the study found that the top six most prevalent types of cancer in the county were; cancer of the oesophagus (69.3%) as the most prevalent type of cancer in the region, this was followed by cancer of the stomach (10.4%), prostate cancer (8.6%), cancer of the cervix (3.5%) and cancer of the liver at 1.1%. The study further established that there was consistent increase in cancer cases in Wajir County over the six year period. The rise in cancer cases was attributed to poor health seeking behaviour among the population, lack of essential facilities and inadequate awareness among the population. The study therefore recommends that there is need to strengthen the health system on cancer management particularly on screening services and creation of cancer awareness among the population in Wajir County. Additionally, the study recommends that there is need to conduct further studies on cancer prevalence based on the population to determine the pattern of the disease geographically in Wajir County.

Keywords: *Cancer, Prevalence, Estimation, Cancer Data, Healthcare Facilities, Wajir*

1.1 Background of the Study

Non-communicable diseases (NCDs) are now responsible for the majority of global deaths and cancer is expected to rank as the leading cause of death and the single most important barrier to increasing life expectancy in every country of the world in the 21st century (World Health Organization, 2018). Araghi, Soerjomataram, Jenkins, Brierley, Morris, Bray and Arnold (2019) postulate that, the increasing cancer burden across the world is due to several factors, including population growth and ageing as well as the changing prevalence of certain causes of cancer linked to social and economic development. However, the new data show that most countries are still faced with an increase in the absolute number of cases being diagnosed and requiring treatment and care. Global patterns show that for men and women combined, nearly half of the new cases and more than half of the cancer deaths worldwide in 2018 are estimated to occur in Asia, in part because the region has nearly 60% of the global population (WHO, 2018).

Cancers of the lung, female breast and colorectum are the top three cancer types in terms of incidence and are ranked within the top five in terms of mortality (first, fifth, and second, respectively) (Wahaia, Kašalynas, Minkevičius, Silva, Urbanowicz & Valušis, 2020). Together, these three cancer types are responsible for one third of the cancer incidence and mortality burden worldwide. According to WHO (2020), cancers of the lung and female breast are the leading types worldwide in terms of the number of new cases; for each of these types, approximately 2.1 million diagnoses were estimated in 2018, contributing about 11.6% of the total cancer incidence burden. Colorectal cancer (1.8 million cases, 10.2% of the total) is the third most commonly diagnosed cancer, prostate cancer is the fourth (1.3 million cases, 7.1%) and stomach cancer is the fifth (1.0 million cases, 5.7%).

In terms of global cancer prevalence by sex, WHO (2020) report indicate that lung cancer is the most commonly diagnosed cancer in men (14.5% of the total cases in men and 8.4% in women)

and the leading cause of cancer death in men (22.0%, i.e. about one in 5 of all cancer deaths). In men, this is followed by prostate cancer (13.5%) and colorectal cancer (10.9%) for incidence and liver cancer (10.2%) and stomach cancer (9.5%) for mortality. Breast cancer is the most commonly diagnosed cancer in women (24.2%, i.e. about one in 4 of all new cancer cases diagnosed in women worldwide are breast cancer) and the cancer is the most common in 154 of the 185 countries included in GLOBOCAN (2019). One in 5 men and one in 6 women worldwide develop cancer during their lifetime, and one in 8 men and one in 11women die from the disease (Plummer *et al,* 2016). Worldwide, the total number of people who are alive within 5years of a cancer diagnosis, called the 5-year prevalence, is estimated to be 43.8 million. Although developing countries bear 80% of the cancer burden, only about 5% of global resources devoted to cancer are found in these countries yet the burden of cancer incidences in sub-Saharan Africa is expected to grow to over 85% by 2030. Cancer is the third leading cause of death in Africa, after infectious and cardiovascular diseases. According to the World Health Organization, only 50% of low- and middle-income countries have operational National Cancer Control Plans.

Europe accounts for 23.4% of the global cancer cases and 20.3% of the cancer deaths, although it has only 9.0% of the global population (WHO, 2018). The Americans have13.3%of the global population and account for 21.0% of incidence and 14.4% of mortality worldwide. In contrast to other world regions, the proportions of cancer deaths in Asia and in Africa (57.3% and 7.3%, respectively) are higher than the proportions of incident cases (48.4% and 5.8%, respectively), because these regions have a higher frequency of certain cancer types associated with poorer prognosis and higher mortality rates, in addition to limited access to timely diagnosis and treatment in many countries (WHO, 2018).

Cancer in Africa is an emerging health problem where about 847,000 new cancer cases and 591,000 deaths occurred in 2012, with about three quarters of these occurring in the sub-Saharan region (Parkin DM *et al,* 2014). Nearly 31% of the total cancer burden in sub-Saharan Africa is attributable to infections (Plummer *et al.,* 2016) Specifically, H. pylori, HPV, HBV, and HCV are the leading infectious agents contributing to the global cancer burden. When summed together they account for 92% of all infection-attributable cancers worldwide with 35.4%, 29.5%, 19.2%, and 7.8% respectively (Plummer *et al.,* 2016). The rise of the HIV epidemic concentrated in low and middle-income countries has resulted to an increase in HIV-associated malignancies (Chinula et al., 2017). The annual incidence of cancer in Kenya is about 28 000 new cases with an annual mortality of 22 000 cases, that is, 78.5% of the victims do not survive. Like the African experience, cancer is also said to be the third leading cause of death in Kenya, after infectious diseases and cardiovascular diseases (WHO, 2018).

In Kenya, Cancer is the third highest cause of mortality [7% of deaths per year], after infectious diseases and cardiovascular diseases. Difficult to get accurate national data because most data is coming from Nairobi and other urbanized settings has contributed to widely spread of the disease in other parts of the country. Estimate 39,000 new cases of Cancer each year in Kenya with more than 27,000 deaths per year and about 60% of Kenyans affected by Cancer are younger than 70 years old. Leading Cancers: Women: Breast (34 per 100,000), Cervical (25 per 100,000) Men: Prostate (17 per 100,000), Esophageal (9 per 100,000)70-80% of cancer cases are diagnosed in late stages (Kenya Network Cancer Organization, 2014).There is no proper data management of information about status of cancers in Wajir County and therefore this study sought to estimate cancer prevalence in Wajir County, Kenya using cancer data at the healthcare facilities.

The burden of cancer in Kenya is felt both at national and household level; at the national level, cancer prevalence impedes poverty reduction initiatives due to factors such as loss of a productive population resulting from premature mortality and loss of productive time due to care giving (Ruto, Muitta, Owino & Makokha, 2020). In addition, increased incidence of cancer has resulted in an increase in government expenditure on treatment and palliative care evidenced by, among other factors, an 11 per cent growth in National Hospital Insurance Fund (NHIF) expenditure on cancer treatment in 2018/19 (Samantha & Lawrence, 2019).

1.2 Problem Statement

In Africa, coverage of high-quality data from cancer registries is quite low, estimated to be below 10% (Lancet 2014). Since cancer incidence and mortality is on the increase worldwide, there is an overwhelming need for countries and sub-regions to adopt and implement cancer control actions. This begins with data, which then should be able to drive policy, reduce the burden and suffering due to cancer. Kenya is facing the growing high demand for cancer treatments, but the nation has very limited supply capacity with respect to diagnosis and treatment that poses serious health-care policy challenges to the government (Wambalaba, F.W, *et al*, 2019). Like the African experience, cancer is also said to be the third leading cause of death in Kenya, after infectious diseases and cardiovascular diseases.

It is noteworthy that high-quality cancer registry data, the basis for planning and implementing evidence-based cancer control programs are not available in most low- and middle-income countries such as Kenya. The annual incidence of cancer in Kenya is about 28 000 new cases with an annual mortality of 22 000 cases, that is, 78.5% of the victims do not survive. Good-quality data for cancer incidence and survival are often unavailable especially in the third world countries (Ira, Zujewski, Dvaladze, Brand & Vogel, 2019).

Cancer diagnosis and treatment is facing serious challenges in Kenya especially in the counties where the treatment facilities are inadequate, unavailable or ill equipped especially radiotherapy machines (Ira et al, 2019). Most of the few ones in Wajir County are in bad conditions without hope of repairing them. The cancer prevalence and burden in Wajir County is largely unknown since there are no clear records documenting the level of cancer prevalence in the County. Currently, there is no information available to inform the extent of cancer morbidity and mortality not only in Wajir County but also in the larger frontier Counties in Kenya. It is therefore difficult to get an accurate data from the existing national data because most data are coming from Nairobi and other urbanized settings with cancer registries such as Eldoret (Parkin *et al*, 2018). This study therefore sought to estimate cancer prevalence in Wajir County using cancer data at the healthcare facilities from 2014 to 2019.

1.3 Study Objectives

1. To estimate the prevalence rates of cancer in Wajir County based on demographic characteristics.
2. To identify cancer cases and their types in Wajir County.
3. To examine trends in cancer prevalence over the period 2014 to 2019.

1.4 Research Question

1. What are the prevalence rates of cancer in Wajir County based on demographic characteristics?

2. What are the cancer cases and their types in Wajir County?
3. How is the trend of cancer disease in the County in the last five years?

2.0 Literature Review

2.1 Theoretical Framework

This study was anchored on theory of Health Behaviour. Health care is a dynamic industry that involves changes in Medicare, insurance, medical practice, clinical trials and regulations (Conner & Norman, 2005). Contingency management theory articulates that to keep up with changing requirements and trends, management should remain flexible and capable of reorganizing structurally and procedurally (Ryan *et al.*, 2008). Resource theory compliments contingency theory by postulating that for organizations to survive, they need to manage based on available resources around them and maximize on the same. Both theories share the view that rather than allow outside forces to affect the organization negatively, the organizations can anticipate and adopt management approaches rooted in change (Fazio & Ewoldsen, 1994).

Many organizations have improved their delivery of services by successfully changing their attitudes toward patient care and adopted a patient-centered approach to management. Instead of developing systems that are cost-efficient, hospitals and health care providers have opted to adapt technologies that enable delivery of the best patient care possible (Sutton, 2005). Best financial results can be achieved through medical and quality service excellence. Top managers now encourage collaboration between departments and interdisciplinary approaches to medicine and formation of multidisciplinary teams to optimize on quality of care given.

The theory has been used by a number of researchers. For instance, Weinstein (1993) while assessing and measuring varying variables considered to be important theoretical mediators and moderators of health behavior indicated that Health Behavior Theory has tended to be particularly interested in understanding people's motivation to change behavior rather than ability to change. Moreover, motivation is thought to be the result of a relatively complex, but logical, interpretation of large quantities of information about self and environment. The theories that Weinstein reviewed deal almost exclusively with behavioral decision processes in people's minds.

Additionally, some the most popular models used in the field of health psychology to understand and predict health-related behaviour are: Health Belief Model (Janz & Becker, 1984), Theory of health Behaviour (Ajzen, 1985), and the Trans-theoretical model (Prochaska & DiClemente, 1983), also known as the ‘stages of change’ model. Further, Rosenstock (1966) argued against applying the theory to cross-sectional data that, in order for the relationship between the behaviour and the components of the model to have any meaning in the context of a cross-sectional design, it becomes necessary to assume that people’s perceptions of these components have not changed since the behaviour was adopted. In 1994, Zimmerman and Vernberg (1994) reported that the theory was predictive of behaviour, but only weakly. Harrison et al (1992) undertook a meta-analysis and concluded that retrospective studies yielded markedly larger effect sizes than prospective studies. Mead and Irish (2020) used Health behaviour theory (HBT) to successfully predict and modify many health behaviours, but its use in the study of sleep health is rare.

According to McLeroy *et al.* (1988), health promotion programs can help to improve health, by focusing on prevention, reducing cost of medical treatment, reduce disease risks, reduce premature

deaths, manage chronic illnesses, and improve the well-being, health status and quality of life of individuals, families, communities, organizations and nations. Successful health promotion programs are based on a clear understanding of the targeted health behaviors and their impact (Aldana, 2001). They are developed and managed using strategic planning models, and are continually improved through meaningful evaluation. The purpose of health promotion is to positively influence the health behavior of individuals and societies as well as the living and working conditions that influence their health. This theory explain how the health behaviours of cancer patients and even the service providers in Wajir County impacts the prevalence of cancer in the County.

2.2 Empirical Review

2.2.1 Prevalence Rates of Cancer

Morounke, Ayorinde, Benedict, Adedayo, Adewale, Oluwadamilare and Benjamin (2017) conducted a study on epidemiology and incidence of common cancers in Nigeria. The study employed a cross-sectional research design in particular a descriptive cross-sectional study design. The study revealed that Nigeria recorded 102079 cases of cancer out of which 27,304 (26.7%) cases were for breast cancer, 14089 (13.8%) for cervix uteri, 12,047 (11.8%) for liver and 11,944 (11.7%) for prostate cancer as incidences. In terms of age distribution, the study indicated that the age standardized incidence rates (ASR) for these common cancers; breast, cervix uteri, liver and prostate were 50.4, 29.0, 11.5, and 30.7 per 100,000 respectively. Another 5-year prevalence study in Nigeria also showed almost the same trend. Breast cancer being the leading cases with 87,579 (37.7%), followed by cervix uteri 35,644 (15.4%), prostate 31062 (13.4%) and then liver 8,447 (3.7%). The mortality as recorded by the study showed that breast cancer caused 13,960 (19.5%) deaths, cervix uteri 8,240 (11.5%) deaths, liver 11,663 (16.3%) deaths and prostate 9628 (13.5%) deaths in Nigeria. The study concluded that cancer data available in Nigeria are hospital based; according to the study it was obvious that cancer incidence and deaths in Nigeria were increasing from year to year.

Wambalaba, Son, Wambalaba, Nyong'o and Nyong'o (2019) examined the prevalence and capacity of cancer diagnostics and treatment focusing on demand and supply survey of health-care facilities in Kenya. The study used a descriptive research design to examine the following demand- and supply-side objectives. The study used a descriptive research method for assessment of prevalence and types of cancer as well as the capacity for diagnosis and treatment of cancer. The study targeted 10 but carried out the survey in 7 of the 47 counties in Kenya between November 2013 and February 2014.Wambalaba et al (2019) revealed that the most frequent age for female patients was at age 52, while for men was at age 62. The most prevalent cancer in women was breast cancer and cancer of the cervix, while for men was cancer of the esophagus and prostate. It was also found that children and rural populations were more vulnerable than it was thought, hence defying the local perception that cancer inflicts only adults and those in urban areas. The study established that accessing cancer screening and treatment was one of the major hurdles as most cancer care services in Kenya were concentrated within a 5-km radius of each other in Nairobi. The study concluded that the limited capacity with respect to diagnosis and treatment has implications to issues of access, proximity and availability.

Makau-Barasa, Greene, Othieno-Abinya, Wheeler, Skinner and Bennett (2017) conducted a study on improving access to cancer testing and treatment in Kenya. In response to the increasing cancer

burden in Kenya, the study identified barriers to patients seeking access to cancer testing and treatment and to clinicians in delivering these services. The study employed qualitative technique and used semi-structured key informant interview to collect the data. Purposive sampling was used to recruit 14 participants: seven oncology clinicians and seven support and advocacy leaders for patients with cancer. The findings revealed that seven barriers to cancer testing and treatment were high cost of testing and treatment, low level of knowledge about cancer among population and clinicians, poor health-seeking behaviors among population, long distances to access diagnostic and treatment services, lack of decentralized diagnostic and treatment facilities, poor communication and lack of better cancer policy development and implementation.

Maranga, Hampson, Oliver, Gamal, Gichangi, Opiyo and Hampson (2013) in their study analyzed the factors contributing to the low survival of cervical cancer patients undergoing radiotherapy in Kenya. The study was conducted between 2008 and 2010, in which 355 patients with histologically confirmed ICC were recruited at the Departments of Gynaecology and Radiotherapy at Kenyatta National Hospital (KNH). Of the 355 patients, 42% (146) were lost to follow-up while 18% (64) died during the two year period. 80.5% of patients presented with advanced stage IIB disease or above, with only 6.7% of patients receiving optimal combined EBRT, brachytherapy and adjuvant chemotherapy. Kaplan Meier survival curves projected two year survival at <20%. The findings revealed that Cervical cancer is preventable yet poverty, poor education, lack of cancer awareness coupled with an absence of regular screening programs, late patient presentation, sub-optimal diagnosis and treatments are major factors contributing to the alarmingly low survival rate of cervical cancer patients in Kenya. It is concluded that simple cost-effective changes in clinical practice could be introduced which would have a marked impact on patient survival in this setting.

In 2013, Khaemba, Mugo and Mutai examined the survival of patients with cancer of the cervix in Nairobi, Kenya. The study employed a descriptive non-intervention study of selected patients with cancer of the cervix in Nairobi, Kenya. 211 patients with an initial diagnosis of cancer of the cervix between January 2006 and June 2007 were followed up for five years respectively. The study found that 108 (51.18%) patients were confirmed dead within that period, 15 (7.11%) were still alive and 88 (41.70%) were lost to follow up. The patients' median age was 46 years. The probability of surviving beyond five years was estimated at 0.198. The cumulative proportion surviving at the end of the study interval was 0.67 at stage I, 0.36 at stage II, 0.15 at stage III and 0 at stage IV. The age of patients, stage at diagnosis and level of education significantly affects the survival. Based on the findings the study concluded that, high levels of health awareness should be embraced. Early detection of cervical cancer through regular screening and, prompt and comprehensive treatment should be taken up to improve the overall survival of the patients.

2.2.2 Cancer Cases and their Types

Macharia, Mureithi and Anzala (2018) assessed Cancer in Kenya with focus on types and infection-attributable. Data from the adult population of two National referral hospitals (2008-2012) was used. A cross-sectional retrospective survey was conducted at Kenyatta National Hospital (KNH) and Moi Teaching and Referral Hospital (MTRH) from January 2008 to December 2012. Data was obtained from the patients files and the study was approved by the KNH/University of Nairobi and MTRH Ethics and Research Committees. The findings revealed that in KNH, the top five cancers were: cervical (62, 12.4%), breast (59, 11.8%), colorectal (31, 6.2%), chronic leukemia (27, 5.4%) and stomach cancer (26, 5.2%). Some 154 (30.8%) of these

cancers were associated with infectious agents, while an estimated 138 (27.6%) were attributable to infections. Cancers of the cervix (62, 12.4%), stomach (26, 5.2%) and nasopharynx (17, 3.4%) were the commonest infection-associated cancers. The study also revealed that in MTRH, the five common types of cancers were Kaposi's sarcoma (93, 18.6%), breast (77, 15.4%), cervical (41, 8.2%), non-Hodgkin's lymphoma (37, 7.4%) and colorectal, chronic leukemia and esophageal cancer all with 27 (5.4%). Some 241 (48.2%) of these cancers were associated with infectious agents, while an estimated 222 (44.4%) were attributable to infections. Kaposi's sarcoma (93, 18.6%), cancer of the cervix (41, 8.2%) and non-Hodgkin's lymphoma (37, 7.4%) were the commonest infection-associated cancers.

A study conducted by The National Cancer Institute (2019) on cancer prevalence rates per county, revealed that Oesophagus cancer is the leading killer cancer in the country and was found to be more prevalent in Kisumu, Kakamega, Nyeri, Nakuru, Bomet, Wajir and Eldoret counties affecting both men and women, according to NCI. The report showed that men living in Nairobi, Kiambu, Mombasa, Meru and Embu counties are prone to prostate cancer than any other types of cancer. Breast cancer was still the most prevalent type amongst Kenyan women from the selected 11 counties. Breast cancer according to the report was more prevalent in Nairobi, Meru, and Mombasa, Kiambu, Nakuru and Embu counties. In Bomet, Eldoret, Nyeri, Kakamega counties, most women patients suffer from oesophagus cancer. The study also revealed that breast cancer remains the top fear for Nairobi women as it ranks highest with 37.4 per cent prevalence rate followed by cervical cancer at 23.7 per cent while oesophagus cancer comes third according to NCI. Most men in Kisumu are at a high risk of oesophogus cancer than any other type of cancer according to the study. In the lakeside city, oesophagus cancer is at 9.9 percent, prostate cancer seven per cent while lymphoma's prevalence rate is lowest at 3.3 per cent. Women from Kisumu on the other hand are more exposed to cervical cancer than any other type of cancer according to the statistics.

2.2.3 Trends in Cancer Prevalence

The study by Wambalaba *et al*. (2019) indicated that the annual incidence of cancer in Kenya is about 28 000 new cases with an annual mortality of 22 000 cases, that is, 78.5% of the victims do not survive. Like the African experience, cancer is also said to be the third leading cause of death in Kenya, after infectious diseases and cardiovascular diseases. In 2005, cancer deaths were estimated at 18 000 people and by 2014, it was estimated at 22 000. Cancer contributed 7% of the total national mortality each year. The annual incidence of cancer was about 28 000 new cases with an annual mortality of 22 000 cases (i.e., 78.5% of the victims did not survive). Most of these data are captured by respective cancer registries.

For example, the Eldoret Cancer registry was established in 1999 in the Faculty of Medical Sciences, Department of Hematology and Blood Transfusion of Moi University's Teaching and Referral Hospital. The registry records details of all patients with cancer diagnosed and treated in hospitals of Eldoret town. Another cancer registry is the Nairobi Cancer Registry, established in 2001 in partnership with the Ministry of Health (MOH) and Kenya Medical Research Institute (KEMRI). Although the Nairobi Cancer Registry has attempted to collect data with respect to the prevalence of types of cancer based on participating facilities in Nairobi, there is still a large gap for such coordinated data at national level. Hence, there is a need for documentation of

demographic distribution of cancer cases and to determine the specific types and nature of cancers in Kenya (Macharia, Mureithi & Anzala, 2018).

A study by Atundo, Chite, Chesumbai and Kosgei (2018) indicate that Kenya was facing the growing high demand for cancer treatments, but the nation's very limited supply capacity with respect to diagnosis and treatment poses serious health-care policy challenges to the government. The problem is that on the demand side, the number of patients has been progressively growing and expected to continue, especially cancers of the cervix, breast, esophagus, and prostate. However, on the supply side, the availability of facilities, equipment, and experts appear not to be growing at a commensurate rate. Therefore, the availability problem is a resource problem that would require sourcing and equipping of medical facilities with screening and treatment services.

2.4 Conceptual Framework

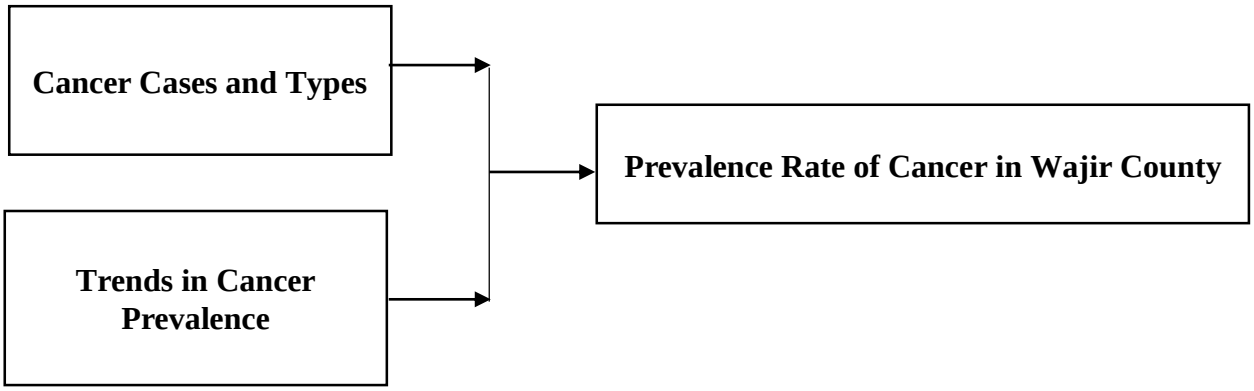

Figure 1: Conceptual Framework

3.0 Research Methodology

Facility-based retrospective records review was employed to estimate the prevalence of cancer in Wajir County This study employed quantitative method approach to estimate cancer prevalence in Wajir County, Kenya using cancer data available at the healthcare facilities, six years post devolution in Kenya (2014 to 2019). The target population included all the cancer patients served as patients between 2014 and 2019 at all the public healthcare facilities in Wajir County. The study extracted from the facilities cancer records for all the patients served in the said period. The study took a sample size of 50% of the primary healthcare facilities that were operating across all the sub-counties in Wajir in 2014. Cluster sampling was used to select the health facilities for the study based on the level of care and sub-county. All the six (6) Sub-county and county public health hospitals was purposively selected, while the health centres and dispensaries were randomly selected after clustering them under the sub-counties and level of care.

The data collection instrument used for this study was a data extraction form that was developed and customized from Nairobi Cancer Registry patient records extraction form. The form as various items of interest for the study to be done. A copy of the form is placed at the appendix. Twelve

research assistants were trained on the data collection instruments and the procedure. This study collected of cancer patients' records in all Public healthcare facilities in Wajir County from 2014 to 2019. The data collected was edited to ensure quality, consistency and generally accuracy. The quantitative data collected was analyzed by descriptive statistics using statistical package for social sciences (SPSS) version 25.0. This version was used since it was among the most recent versions of SPSS with advanced features. The results were presented in tables, charts and graphs.

4.0 Findings and Discussions

The alarming trend of cancer in Wajir County underscores the need to develop evidence-based interventions that can effectively handle this volatile epidemic. The evidence generation entails the collection of adequate information on burden, pattern, and prevalence of cancer relative to capacity to promote effective decision-making. Accordingly, this study documents the prevalence and types of cancer in Wajir County. Although some health facilities in Wajir County have attempted to keep data on cancer, there is still a large gap in the information system at the county especially the data on cancer at the facilities. The unavailability of complete information or details regarding the cancer patients admitted in health facilities in Wajir County makes it difficult to document the actual prevalence rate of cancer in the region. For instance, patients residences address in the county is lacking in the records of the facilities sub-county) and this has serious implication on the prevalence of cancer geographically. Additionally, inconsistency on capturing of the various data items in the records such as patients' age makes it difficult to document the actual prevalence of cancer in the county by age as this study found that 183 (40.4%) had data on their ages missing from the records.

4.1 Prevalence Rates of Cancer in Wajir County

Based on the results as presented in Figure 2, slightly more than a half (50.20%) of the cancer patients served by the health facilities in Wajir County between 2014 and 2019 were females, compared to 49.80% males. The results showed that there were almost the same number of male and female cancer patients served in the facilities between 2014 and 2019. These results imply that cancer is slightly more prevalent among females in Wajir County compared to men. These results are consistent with the findings of a study by Wambalaba, Son, Wambalaba, Nyong'o & Nyong'o (2019) on cancer prevalence in Kakamega General Hospital, Jaramogi Oginga Odinga Teaching and Referral Hospital, Rift Valley General Hospital, Moi Teaching and Referral Hospital, Marigat District Hospital, Kenyatta National Hospital, Coptic Hospital, Texas Cancer Centre, Karen Hospitals, Nyeri General Hospital, Machakos District Hospital and Pandya Hospital. The study found that most of the patients diagnosed with cancer in the above facilities were women at 57% compared to men at 43%.

Figure 2: Sex of Patient

Analysis on age distribution of cancer cases recorded in Wajir County between 2014 and 2019 revealed that most 62 (23%) of the recorded cases were aged between 51-60 years, 55 (20.3%) were aged between 61-70 years, 34(12.5%) were aged between 41-50 years, while 31(11.4%) of the patients were found to be aged between 31-40 years. The results also show that 28(10.3%) were aged between 21-30 years, 9.2% were aged between 71-80 years, 21(7.7%) of the patients were found to be between 81-90 years, 12(4.4%) were aged between 10-20 years, while only 3(1.2%) of the patients whose records were available were aged more than 90 years.

The results on age distribution imply that most of the cancer patients served as patient by all the health facilities in Wajir County between 2014 and 2019 were above 50 years old with the prevalence being highest among those aged between 51-60 years. This further imply that in Wajir, cancer disease is more prevalent among senior members of the population as compared to younger people. Based on the results, only 12 (4.4%) of the cases recorded in all the health facilities between 2014 and 2019 were aged between 10 and 20 years pointing to the fact that prevalence of cancer in the County is low among younger population (teenagers). According to the findings, the youngest cancer patient was 10 years old, while the oldest was 95 years old. The mean age of cancer patients admitted in the facilities between 2014 and 2019 was 54.88 years with a standard deviation of 19.254. These findings are consistent with the findings of a study conducted Bandyopadhayaya, Bundel, Tyagi, Pandey and Mandal (2020) which indicated that, approximately 60% of all cancers occurred in the older adult population, resulting in an incidence rate that is 10 to 11 times higher than in the younger population. Bandyopadhayaya, et al (2020) revealed that the risk of developing cancer was 8%–9% in people age 40–59, with a dramatic increase in risk of 20%–30% in people older than 60 years of age. Additionally, cancer mortality rates are higher for older adults, with approximately 70% of all cancer deaths occurring in people older than 65.

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Journal of Medicine, Nursing & Public Health
Volume 4||Issue 1||Page 25-45||March||2021|
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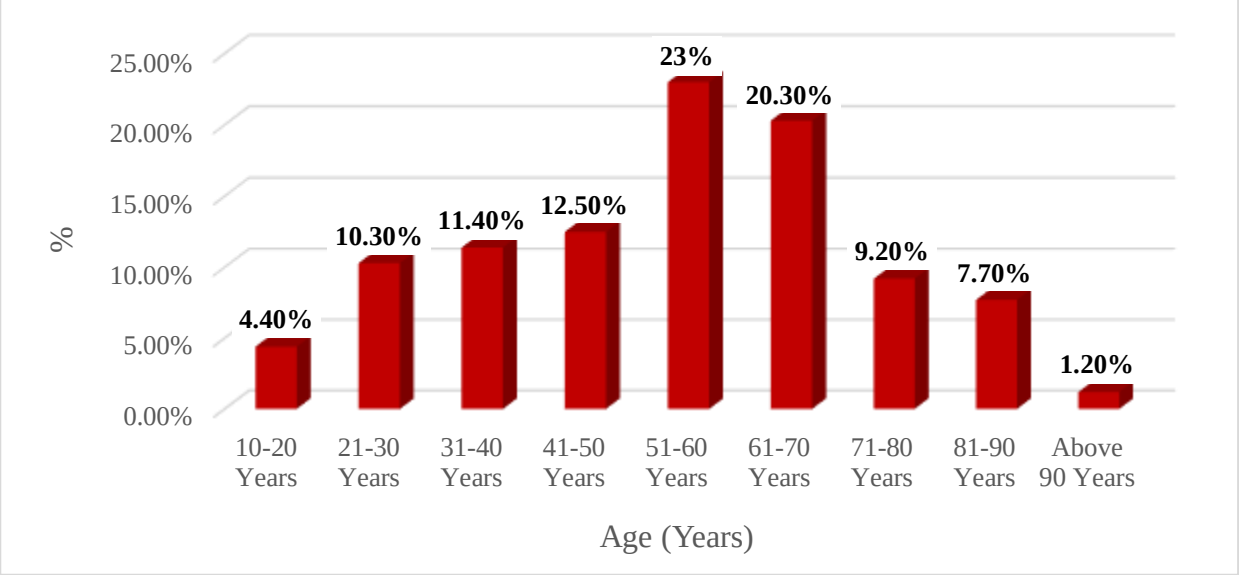

Figure 3: Patients' Age Distribution

The data was mainly from one facility - Wajir County Referral Hospital (WCRH) – 68.3%. Most of the other facilities were not keeping records of cancer patients, Within WCRH, most of the cancer cases (72.40%) were retrieved from radiology section, followed by OPD section (14.6%) and then Emergency & referral section of the department (9.30%).

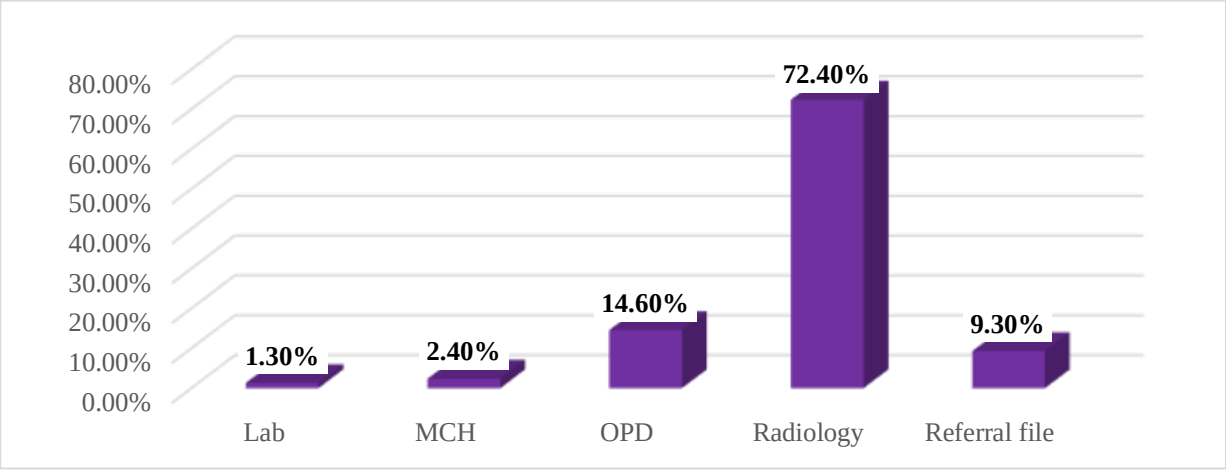

Figure 4: Sections from which Data was retrieved

The study sought to establish the survival status of the cancer patients served as patients in health facilities in Wajir County between the years 2014 and 2019. The findings as presented in Figure 7 revealed that the information regarding the survival status of majority (93.60%) of the cancer patients could not be obtained from the records i.e. contacts. However, of the cancer patients whose survival status were recorded, 3.50% had died, while 2.90% were still alive as at the time of this study. The results imply that most of the health facilities in Wajir County lack records on the survival status of their cancer patients, pointing to the fact that there is poor follow up visits by the facilities on cancer patients once they are discharged from the facilities.

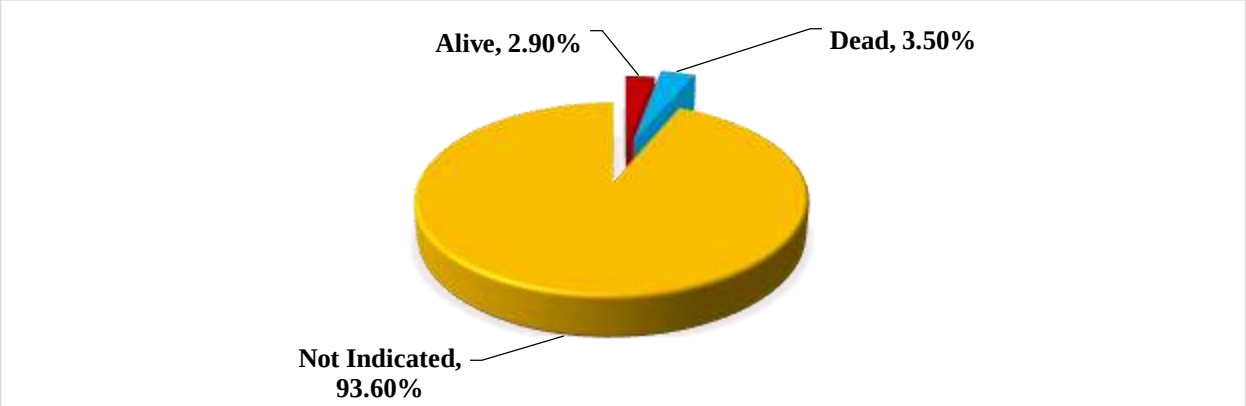

Figure 5: Survival Status

4.2 Cancer Cases and their Types in Wajir County

The study sought to find out the cancer cases and their types in Wajir County between 2014 and 2019. Based on the analysis results, the most common type of cancer reported in Wajir County was found to be cancer of the oesophagus; majority 314(69.3%) of the cancer patients served in the facilities had cancer of the oesophagus making it the most prevalent type of cancer in the region. The second most common type of cancer reported was cancer of the stomach as 47(10.4%).

The study also found that prostate cancer was the third most prevalent type of cancer at 39(8.6%), 16(3.5%) were diagnosed with cancer of the cervix, 5(1.1%) were found to have cancer of the liver 4(0.9%) cancer of the breast, another 4(0.9%) cancer of the tongue and leukemia (0.9%). Additionally, it was established that 3(0.7%) of the cases were cancer of the bladder, 3(0.7%) were cancer of the rectum, while 2(0.4%) were cancer of the skin. All the other types of cancers recorded cases of less than 1% each; however, 5(1.1%) of the cases were unspecified. The results are contrary to the findings of a study by MOH (2017) which found that the leading cancers in Kenya were breast, cervical, prostate, Kaposi sarcoma and esophageal cancers. The results were presented in Table1.

Table 1: Cancer Cases and Types in Wajir County

Type	Frequency	Percentage
Ca Bladder	3	0.7
Ca Brain	1	0.2
Ca Breast	4	0.9
Ca Cervix	16	3.5
Ca liver	5	1.1
Ca lymph node	1	0.2
Ca Oesophagus	314	69.3
Ca Ovarian	1	0.2
Ca Pelvic	1	0.2
Ca Prostate	39	8.6
Ca rectum	3	0.7
Ca Skin	2	0.4
Ca Stomach	47	10.4
Ca Testis	1	0.2
Ca Tongue	4	0.9
Cheekbone Lymphoma	1	0.2
Eye Carcinoma	1	0.2
Leukimia	4	0.9
Un-specified	5	1.1
Total	**453**	**100**

Regarding the stages at which the cancer cases were diagnosed, the study established that most (68.8%) of the reported cancer cases were diagnose at stage four, compared to 18.8% diagnosed at stage three. The study however established that the reported cancer cases diagnosed at stages one and two were each 6.2% of all reported cases in Wajir County between 2014 and 2019. The results imply that most of the cancer patients in Wajir County seek cancer treatment when the disease is at its advanced stage, which may be due to lack of proper information about the symptoms of cancer among the population. These findings are in agreement with the conclusion made by Ministry of Health (2017) that, more than 70% of reported cases of cancer in Kenya are diagnosed at advanced stages when little can be achieved in terms of curative treatment. The Kenya National Cancer Control Strategy aims at reinforcing health promotion and cancer prevention, improve public awareness of cancer symptoms and risks, improve early detection of cancer and expand the treatment resources (MOH, 2019).

A study conducted by world Health Organization in 2019 revealed that most of the cancer cases in Kenya are detected at late stages because of lack of awareness among the population. Health promotion programs such as mass cancer awareness campaigns have been based on the idea that individuals are purposive and decisive thus providing them with knowledge on the illness will promote a change in their health seeking behavior. However, this has proven to be insufficient in itself to promote behavior change and thus there's need to explore the dynamics that influence the well-being of communities. A wide range of factors that may directly or indirectly influence

health-seeking behavior have been identified; these include cultural, social, psychological and economic factors. The results are presented in Figure 6.

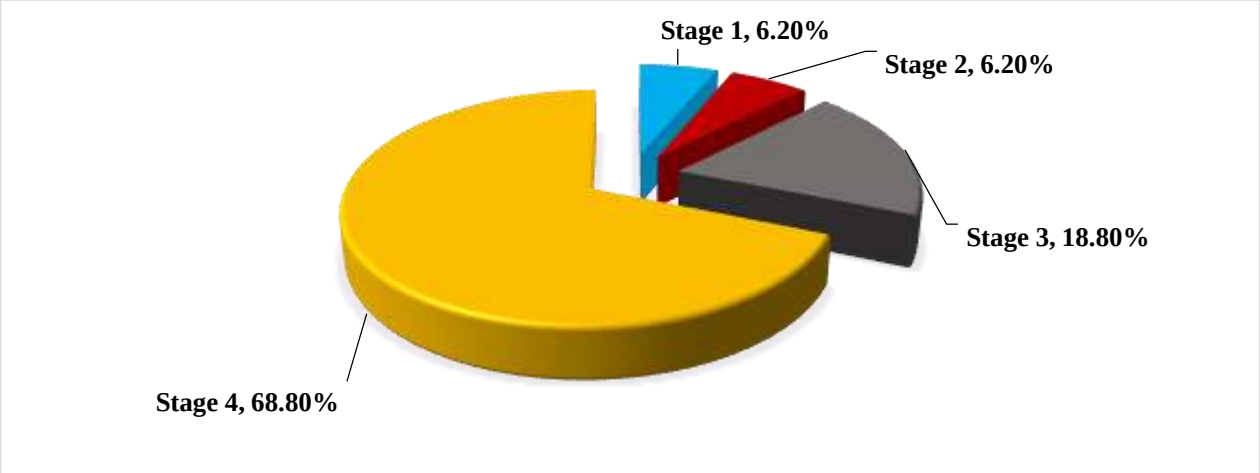

Figure 6: Stage at Cancer Diagnosis

Most of the cancer cases recorded by health facilities in Wajir County are cases diagnosed clinically (60.5%) as presented in Figure 7. while 24.10% were confirmed through diagnosis, while data on 15.50% of the reported cases were missing from the records. The results imply that most of the reported cancer cases in Wajir County between 2014 and 2019 were clinically diagnosed.

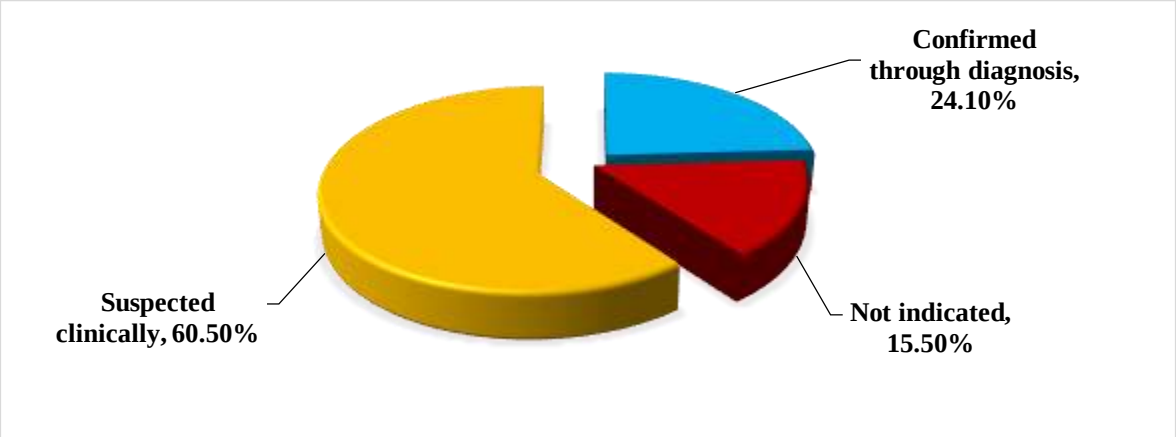

Figure 7: Method of Cancer Confirmation

4.3 Trends of Cancer Cases in Wajir County (2014-2019)

The study established that there was consistent rise in cancer cases in Wajir County between 2014 and 2019 as indicated by trend line in Figure 8. The prevalence of cancer in the County was 3.8% in 2014 which remained the same in 2015 before increasing significantly to 5.1% in 2016. In the year 2017, the cancer cases recorded in the County stood at 11.7% which rose significantly to a high of 25.8% in 2018 before shooting further to 49.7% in 2019. The results point to the fact that the cancer prevalence in the County is in an upward trajectory. These findings are in agreement with the assertion by MoH (2020) that non-communicable diseases (NCDs) are the leading cause of morbidity and mortality in Kenya, causing more deaths than all other causes combined. The burden of cancer has been increasing for the past few decades with the number of new cases expected to rise by about 70% over the next two decades. In Kenya, NCDs account for more than 50% of total hospital admissions and over 55% of hospital deaths. Cancer is the second leading NCD after cardiovascular diseases, accounting for7% of total national mortality and making it a public health concern. Trend line below shows how prevalence has been increasing in Wajir County over the past 6 years (2014-2029).

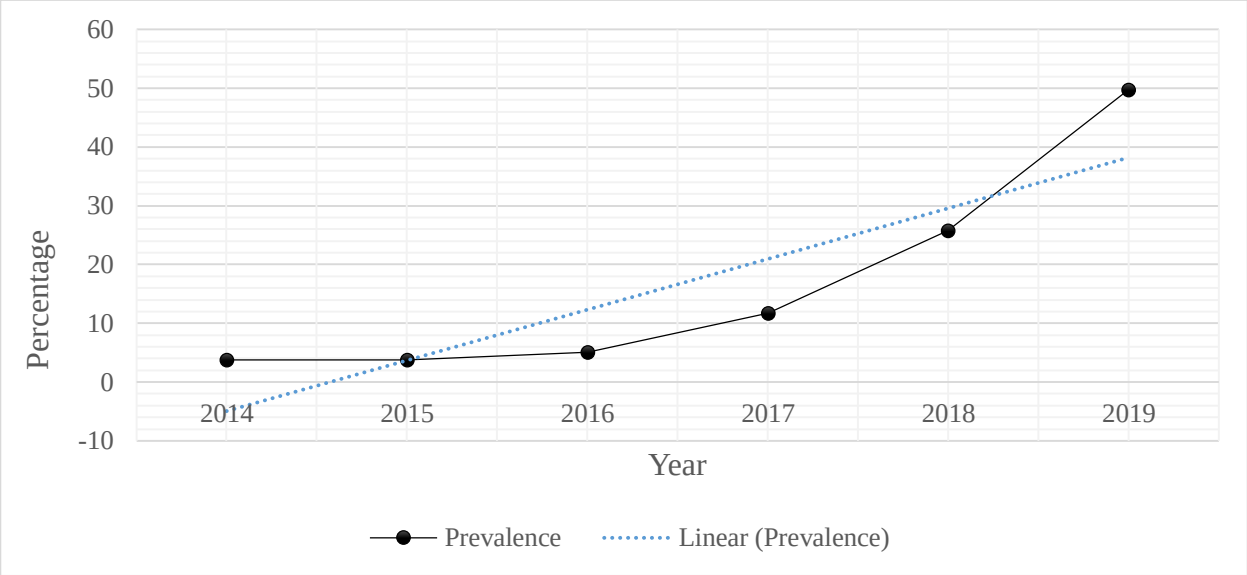

Figure 8: Cancer prevalence trend in Wajir County

5.0 Conclusions

Based on the findings, it suffices to conclude that there is poor documentation of diseases in Wajir County. This poor documentation could be attributed to lack of proper supervision on record keeping in the healthcare facilities, lack of interest on the part of staff and the management, lack of policy and implementation, or inadequate standardization of data capturing records. Nevertheless, on the basis of the available data, the cancer cases are on the rise in Wajir County, Kenya. The study found that there was consistent gradual rise in cancer cases in the County between 2014 and 2019. This increase or rise of the cases could be attributed to an actual increase of the disease burden in the county, or an improvement in the utilization of the services at the

referral facilities by the clients, or deployment of staffs who are committed to their work or the county government systems taking root.

Cancer is a major threat to sustainable development in the County and the country at large as the associated disease burden is expected to continue increasing for the foreseeable future. Oesophagus, Stomach, Prostate, and Cervical cancers are the leading types of cancer cases in both males and females across all ages in Wajir County. Unhealthy lifestyles, poor quality food supply, increase in the environmental contamination and degradation, poverty, could be contributing to the upsurge of the disease. It was noted that most of cancer patients in Wajir County are diagnosed at an advanced stage when it is not amenable to cure; this could be attributable to lack of resources and basic infrastructure, or inadequate services at the health care facilities hence limits access to cancer screening, early diagnosis, treatment or palliative care; priority given to other diseases such communicable diseases by the county; poor public awareness on cancer.

As established by the study, most of the cancer cases in health facilities in Wajir County were clinically diagnosed. This is the reality in Kenya where many are not accessing screening services or cancer is detected at late stage. This can be attributed to lack of cancer management services whether screening, diagnosis, treatment or palliative at the healthcare facilities in the county. The Cancer Prevention and Control Act 2012 and the National Cancer Control Strategy (NCCS) 2017-2022 highly prioritizes prevention, screening and early detection. Efforts to promote early presentation and faster referrals, diagnosis, and treatment need urgent intervention in all levels. This study concludes that with the cancer treatment now included in NHIF, there is need for sensitization for the general population to join NHIF in line with UHC, establish health promotion and prevention programs for cancer screening at level 1, 2 and 3 facilities, use community health workers in line with the community health strategy to promote cancer prevention programs and counties to operationalize cancer services (functional) at level 4 or 5 facilities.

6.0 Recommendations

Based on the findings and conclusions, this study makes the following recommendations:

1. The study found inadequacies of the data and documentations on the disease in the health care facilities. The study therefore recommends that there is need for a similar study to be conducted in future based on the population so as to get the clear picture on the prevalence rate of cancer in the County.
2. The study recommends for a strategy to strengthen the documentation, completion & accuracy of data capturing and processing for health service improvement. This can be done through ensuring that healthcare workers in health facilities in Wajir County are taken through regular seminars, refresher courses and regular trainings on the importance of recording cancer data.
3. The Ministry of Health and county government of Wajir should work together and involve other stakeholders to encourage and improve access in the utilization of the health care facilities by cancer patients.
4. The county government of Wajir should prioritize early detection/ screening to ensure cancer cases are detected early for better treatment outcomes. Prevention of cancer would be a cheaper option compared to treatment of the same, palliative care for advanced cases should also be an area of priority for the county government of Wajir.

5. Based on the findings of the study, cancer of the oesophagus is the most common type of cancer in Wajir County. This study therefore recommends that there is need for further study to be conducted to establish the risk factors for this type of cancer in Wajir County.
6. For Wajir County to make any substantial progress in cancer prevention and control, it is necessary that the county government of Wajir takes proactive steps to ensure suitable cancer control programmes are adopted in all the six sub counties. Additionally, corporate funding support from private companies and multinational companies should be encouraged to complement the budget in the County. The County government of Wajir could introduce incentives for any private or individual investment in cancer care services or research in the form of a compensatory tax deduction or other mutually agreed benefits to encourage this communal programme.
7. Finally, development of a comprehensive oncology or cancer care programme is necessary in Wajir County to promote effective management of patients with cancer. The first role of the programme should be to sensitize the relevant authorities both at the county government and national level on the position of the oncology services in raising the wellbeing of the population in the county. There is also a need for inclusion of information on cancer management in training curricular for health care professionals.

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