

## **Effects of Cancer on the Socio-Economic Dimensions of Patients: Evidence from Nakuru Level 5 Oncology Clinic**

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### **Abstract**

This study aimed to show how cancer has affected the economic and psychosocial aspects of patients' livelihoods in Nakuru County. The study adopted descriptive survey design and draw on a quantitative inquiry. The sample size, determined by Fishers method, were 245 patients and 10 medical officers (medical superintendent, oncologists and nurses) drawn from the Nakuru County Teaching and referral Hospital. The research instruments employed were the questionnaire and interview schedules. Before the actual data collection, piloting of questionnaires and the interview schedule was done in Moi Teaching and Referral Hospital in Uasin Gishu County. Data analysis followed both parametric and non-parametric approaches. Data was presented using graphs, tables and scatter diagrams. The findings of the study suggest a strong association of cancer with loss of income ( $\chi^2_{16}, 0.01 = 40.101$ ) and a significant increase in medical expenditure ( $\chi^2_{12}, 0.01 = 66.789$ ). Similarly, it was shown that cancer patients were impacted both socially and economically by cancer type ( $\chi^2_{12}, 0.033 = 22.46$ ) and duration of treatment. The results from the study will contribute immensely to the development of new strategies to improve patients' economic status in the management of cancer within Nakuru county and Kenya in general.

**Keywords:** Cancer, household, socioeconomic, livelihoods, psychosocial, poverty

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## Introduction

The Nakuru Oncology clinic was started in 2018 to take care of increasing cases of cancer in the larger Rift Valley province. Establishing an oncology clinic in Nakuru was done to bring health services closer to residents of the region as they face many challenges associated with access to health services. Nakuru County is one of the 47 counties of the republic of Kenya established in the Constitution of Kenya 2010. Now the county is facing major challenges especially in the health sector and social economic development. According to the Nakuru County Integrated Development Plan (2018), some of the challenges being faced by the county include high poverty levels and inaccessibility to health services among others. The report shows that a large percentage of the county population (66.3%), travel for more than five kilometers to access the nearest health facility making it hard for the county to achieve development goals related to health.

Kenya being a developing country still experiences inefficiencies in the health and financial systems. The World Bank (2014) reported that 44 % of the country population lives below the poverty line of 1.25 US dollars per day. Moreover, it was reported that 18.4 million Kenyans, out of 46 million, live in extreme poverty. These statistics paint a depressing picture especially for individuals who are facing the burden of dealing with cancer.

Cancer not only causes pain and suffering to the patient but can also bring social and economic distress. Other than increasing the demand on health care, it hampers the ability of an individual to generate income especially through increased absenteeism from work or by ultimately impeding peoples to work (Maina, 2009). Further, the effects of cancer can cause distress to the family by affecting their social lives and livelihoods. As such if cancer reduces employment and labour supply, it would cause an efficiency loss to the economy as a whole because the endowment of labour is not fully used. If it hinders people from supplying labour to the economy, then it denies them

or reduces their income level and this has implications to their livelihoods.

## Literature Review

A review of existing literature shows that studies carried out under this subject have either taken a generic approach of classifying all non-communicable diseases or have not specifically targeted the socio-economic implications of cancer in a relatively homogenous community (Ferlay et al., 2012; Ministry of Health, 2011). By concentrating on a smaller population that has some form of homogeneity, this study aimed to show how cancer has affected the economic and psychosocial aspects of patients' livelihoods in Nakuru County. The general objective of this study was to investigate the effect of cancer management on socio-economic status of cancer patients in Nakuru PGH Oncology clinic. Specific objectives include; to determine the effects of commonly diagnosed cancers on the socioeconomics of patients in Nakuru PGH Oncology clinic and to evaluate the impacts of cancer stage at diagnosis on the socioeconomics of patients in Nakuru PGH Oncology clinic.

## Economic Impact

Cancer's toll on population health is inextricably linked to the economic impact through increased medical costs, lost income and the financial, physical and emotional burden placed on families and caregivers. Various studies have shown the economic impacts of cancer on patients and households. For instance, it was shown that a year after diagnosis, only 23% of cancer patients from eight countries in the Association of Southeast Asian Nations (ASEAN) were alive with no financial catastrophe, implying that over half of the people were financially affected in one way or another financially (Kimman, et al., 2015).

Another study shows that more than two thirds of women with breast cancer were facing financial constrains because of restrictive treatment costs. It is evident that the treatment and management of cancer is so expensive such that in most cases the average monthly cost of

management far exceeds the monthly household income. It is also reported that the rates of unpleasant expenditure and economic hardships due to high treatment costs for cancer were greater among older patients and those belonging to low income families, unemployed and not having health insurance (Zaidi, Ansari, & Khan, 2012).

### Social Impact

Describing social impacts from various aspects of communities or livelihoods has been marred by inconsistencies. This is because of the complexity in human societies and interaction (Vanclay, 2001). However, over time many social scientists have developed classifications that have contributed to the realignment of social impact definitions. People's way of life was found to be the major element in assessing social impacts on communities. This aspect looks at how people live, play, work and interact with one another. Another important element is the health and wellbeing of individuals and households. The word 'health' in this case referring to the WHO definition where it is looked at as "a state of absolute physical, mental, and social well-being, not just the absence of disease or infirmity". The last important variable to assess in social impact assessment is the fears and aspirations of a community (Vanclay, 2001). This includes peoples' perceptions about their individual safety, the continuity of their community and aspiration about their future lives together with the coming generations.

### Methodology

The study was conducted in the Nakuru Level Five Hospital in Nakuru County, Kenya. The study targeted patients seeking treatment in the Nakuru Level five hospital together with the affected household members. Data was collected from hospital records in the oncology clinic from patients who are over 18 years. Fisher et al. (1998), established the sample size of 245 using the formula. The sample size was distributed proportionately among the five months period since the clinic was started. A systematic random sampling method was used to select individuals to be interviewed. Data collection was done through several

methods. Primary data was acquired through self and researcher administered questionnaires. Key informant interviews (KIIs) and focused groups discussion (FGDs) was used to obtain data from the medical personnel and caregivers. Secondary data was acquired from various sources as need arose. Data collected was captured using the Epidata entry software, which then exported to the statistical package for social sciences (SPSS-Version 25) computer programme where the data was cleaned using frequency distributions and cross-tabulations to remove majority of the errors in the data. Before analysis, coding as well as generation of composite variables were done to assist in producing accurate results that can be able to answer the research questions. Both descriptive and inferential approaches were utilized in the analysis. The output of the inferential analysis was tested at probability level of  $p=0.05$  level of significance.

## RESULTS AND DISCUSSION

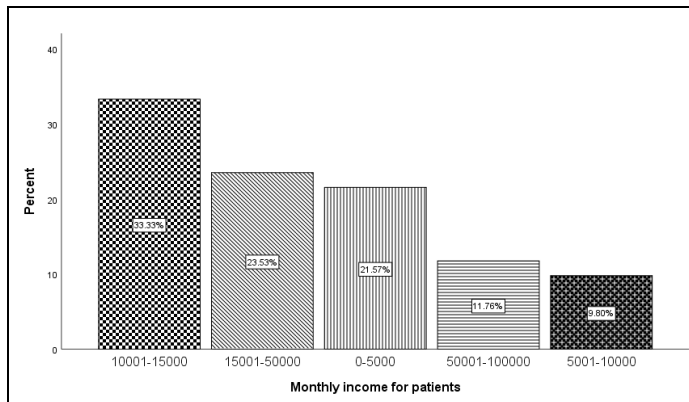
### Economic Impacts: Impact of Cancer on Income

A Chi square test carried out to see whether there was a dependence on patients income on a case of 'before and after cancer' suggested that there was a significant ( $p<0.01$ ) variation ( $\chi^2_{16,0.01} = 40.101$ ) in the distribution of respondent's income under the two categories. From the focused group discussion, it was evident that most of the patients earned less than Ksh. 20,000 per month and were not able to take care of the medical cost for cancer treatment. Only a small percentage of 11.76% mentioned that they earn between Ksh. 50,000 and Ksh. 100,000 (Figure 1). Key informants observed that more than 95% of cancer patients in Kenya are unable to afford cancer treatment comfortably.

Many studies have asserted the poor condition of most cancer patients (Lim et al., 2012; Chuang et al., 2014). This information was reverberated in the current study where it was established that most of the cancer patients in Nakuru Oncology clinic were of low socio economic group. Another study carried out in Kenya reported most respondents parted with between 5,000 USD to 10, 000 USD on cancer

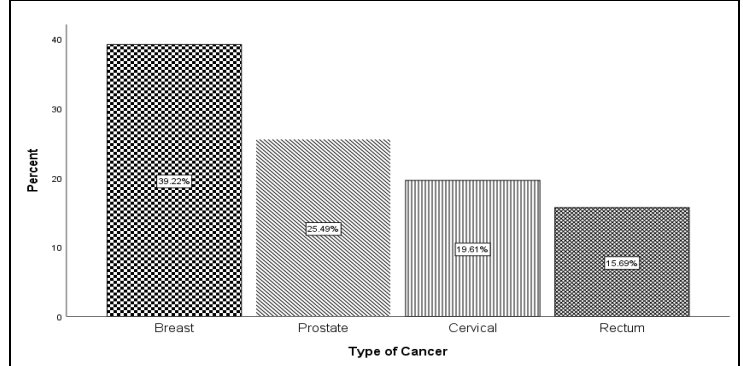


treatment annually, which is too expensive for a majority Kenyans. This situation has exacerbated magnitude of socioeconomic impact of cancer on patient livelihoods where patients have had to dispose their assets to meet cancer treatment costs.



**Figure 1: Patients gross monthly income**

The findings of this study were supported by a study carried by Chuang et al. (2014) who suggested that there was a significant reduction in income due to interruption in money generating activities by cancer patients. Families of cancer patients noted a 45% decrease in hours worked which resulted to less income, delays in paying for important services such as electricity and telephone and the sale of property or use of savings and a reduction for food consumed. This interruption further resulted in household's children regularly missing school days. In addition, increased risk of not complying with radiotherapy was observed in individuals from households that lost family income. These risks of financial constraints have been exacerbated by lack of health insurance and other barriers to comprehensive health care in Nakuru Oncology clinic and other health facilities in the country.



**Figure 2: Types of cancer detected**

A Chi square test to measure the impacts of cancer treatment on patients by cancer type indicated that there was a highly significant ( $p < 0.05$ ) variation ( $\chi^2_{12}, 0.033 = 22.46$ ) in the relationship of these two factors.

**Table 1: Impact of Specific Cancer treatment on Patient**

Type of cancer	Impact of treatment on Patient				
	Family Breakups	Loss of friends and relatives	Limited participation in social	Negligence	Stigmatization
Prostate	40.0%	13.6%	0.0%	50.0%	0.0%
Cervical	0.0%	36.4%	33.3%	0.0%	0.0%
Breast	20.0%	31.8%	66.7%	50.0%	100.0%
Rectum	40.0%	18.2%	0.0%	0.0%	0.0%

The impact of cancer on income can also be associated with the cancer site of the patients. Certain cancer types were found to have negative impact on patient's income than others. A study carried out by Zaidi, Ansari and Khan, (2012) found that the total economic impact of cancer varied significantly depending on the type of cancer





(cancer site) an individual had been diagnosed with. It was reported that monthly additional financial impact linked to cancer of the uterus, cervix prostate, and kidney was comparatively low. Everything else being equal, those with cancer of the stomach, and liver were particularly likely to have incurred a loss of income. The odds were lowest among those with any other type of cancer.

These findings also corresponded with the outcome of a research carried out in the United States of America by Brown and Yabroff (2006) who reported that the odds of incurring a loss of income was higher among those with the lowest incomes compared to those with the highest incomes. They were also high among those who were working at the time of diagnosis in comparison to those who were not. These figures were also higher for partnered households compared to the single adult households. Despite the findings reported by many studies in this subject, some studies reported conflicting information in that a large proportion of patients had experienced no quantifiable change in their family incomes because of cancer diagnosis (Kanavos, 2006). This report showed that a large minority had experienced a decrease in their household's income because of their diagnosis. Only a small minority had higher incomes following their diagnosis and treatment.

### **Impact of Cancer on Expenditure**

The results of the study showed that there was a positive significant relationship between the development of cancer and the increase in medical expenditure. This was due to the change in the costs associated with medical expenses before and after cancer development ( $p < 0.01$ ) variation ( $\chi^2_{12}, 0.01 = 66.789$ ) in the change of patients expenditure for the two cases. Information from the FGDs confirmed that there was a major increase in medical expenditure after cancer development for the patients. This scenario contributed significantly to the reduction in patient's income together with associated financial constraints.

Findings of the current study corroborate with results reported in a study in Haiti, which found that approximately 75% of women with breast cancer faced financial constraints because of the treatment costs (Kimman et al., 2012). Further, households with cancer family members spent 36–44% of their total yearly expenditures and they could lose up to 3% of the household workforce to allocate time for taking care of patients. Another study also noted that the economic burden of cancer care was extensive and mostly carried by the patient or the family (Kimman et al., 2012). Most of the time, the typical monthly cost of cancer management far surpassed the monthly household income. Past literature review also indicated that families with chronic disease patients, including cancer, had to spend a considerable share of their incomes on care for these diseases and many of them faced cataclysmic health expenditure and misery as a result of the spending (Lim et al., 2012; Chuang et al., 2014).

Several factors influence the expenditure on cancer during treatment. Characteristics relating to the patient's cancer diagnosis were noted as important drivers of experiencing any added cost, with certain types of treatment and cancer status being significant in the relationship (Chuang et al., 2014). The level of expenditure was twice as high for individuals undergoing surgery or chemotherapy in the past six months compared with those who had not. They were also high among patients with advanced, secondary or metastatic cancer or that which had recurred or relapsed.

Another study found that the households in which there was a job loss were 2 times more likely to experience cataclysmic health expenditure than households without job loss (Lim et al., 2012). Results suggested that a cancer diagnosis brings the possibility of unemployment and income changes for patients. This finding suggests that many newly diagnosed patients may be at risk of financial difficulties and potentially critical issue for families. Social factors were also seen to be associated with catastrophic



health expenditure. This include: low education level, female head of household, old age, low household income, married, living with senior citizens, health insurance type and early cancer diagnosis stage (Chuang et al., 2014).

Catastrophic health expenditures were more likely recur depending on certain factors. For instance, household heads who were male as well as belonging to older age groups showed a higher possibility of experiencing catastrophic health expenditures more than once. This possibility was lower for householders with high education level and those economically stable. Higher education levels result in a low incidence of catastrophic health expenditure (Chuang et al., 2014). Medical insurance also played a major role in expenditure of households on cancer treatment. A study carried out by Kimman et al. (2012) showed that there is a lower probability of catastrophic health expenditure in households gets medical care benefits suggesting that these households have relatively high medical security as the government takes care of most of the health expenditures.

The key role of household income in cataclysmic health expenditure was consistent with studies in other countries (Chuang et al., 2014). In China, deprived households and rural households were the most likely to face misery and economic hardships. Income inequality worsened the hardships of catastrophic direct payments. Furthermore, households with hospitalized patient were 12 times more likely to suffer catastrophic health expenditure compared to households with outpatient care; households accessing outpatient care were 3 times more likely to incur catastrophic health expenditure compared to patients not accessing healthcare.

#### Financing Cancer Treatment

Results from questionnaires indicated that more than half (76.47%) of the patients depended on self-income for treatment while 15.69%, 3.92% and 3.92% relied on family contribution, insurance and family assets respectively. This shows that a majority of the patients were paying for their

expenditures through self-income. Further probing from the focus group discussion and key informants showed that most of the patients had incurred a form of debt while seeking treatment.

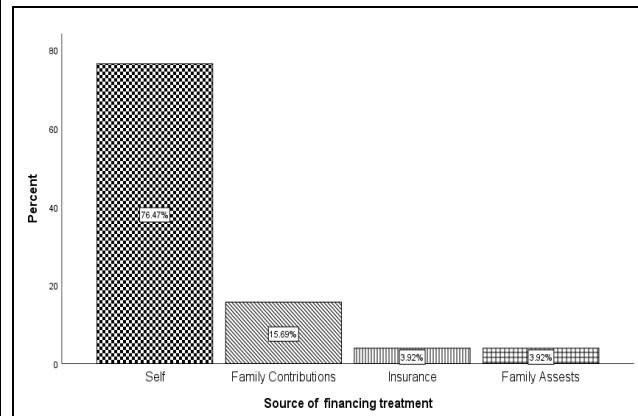


Figure 3: Sources of funds for cancer treatment at the household

The burden of additional expense or loss of income resulting from cancer has led most people to draw on resources other than their steady income at some point since their diagnosis. For many, this involved using up savings, exploiting commercial borrowing and requesting financial help from friends and family. These findings were corroborated by results reported by Zaidi et al. (2012) who noted that large number of patients mentioned that they had used regular incomes, such as income from earnings, pensions or social security benefits. The study also noted that 60% of people had used sources apart from their regular income to help meet any additional costs due to cancer treatment. Majority of the patients used savings to meet these increased costs, possibly from the income generated by savings. This observation may partly reflect the bias towards older individuals among those diagnosed with cancer, who may have been drawing on money they had put aside for their later years during their working lives.



The focus group discussions also disclosed that some people were reluctant to use up their savings in meeting treatment cost and instead turned to family or friends for help. In comparison, it was unusual for people to say they had turned to other types of borrowing, including both unsecured and secured loan. This is consistent with very low rates of use of alternative forms of credit among the public (Collard et al., 2012). The author reiterates that borrowing was very unusual among people with cancer, being reported by less than one per cent. Another study supporting the findings of the current study reports that almost as many people had taken a loan or gift of money from friends or family as had borrowed commercially in order to help pay for the increased costs of cancer (Farmer et al., 2010). Additionally, the support either offered by friends and family, in kind or cash, often played a critical role in offsetting the costs of cancer. They included family or friends driving cancer patients to hospital. Help also came in the form of childcare, helping with the school run or cleaning the house.

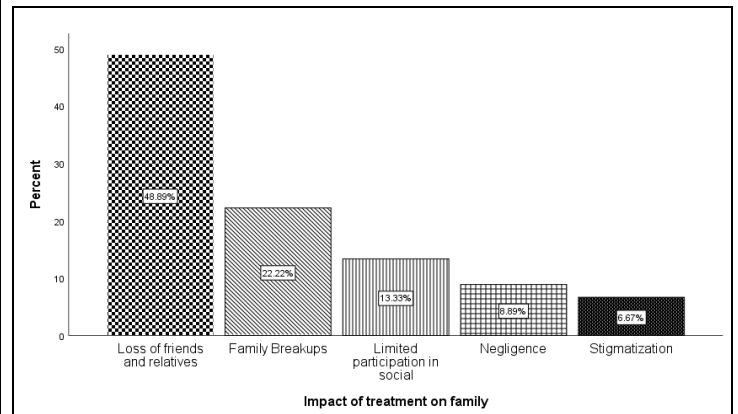
In terms of selling family assets, the findings were supported by Kanavos (2006) who mentioned that a large minority of people with cancer had sold belongings to help them pay for the additional financial costs following a cancer diagnosis. Cancer types were found to have strong association with source of funding. Farmer et al. (2010) reported that cancer type was a strong predictor of people turning to family and friends for assistance. The chances were particularly high among those with cancer of the mouth, lip and pharynx. They were also high among people with breast cancer, colorectal cancer and cancers of the reproductive system. Other strong predictors of drawing on loans or gifts of money from family and friends related to patient's social class.

## Social Impacts

### Psychosocial Impacts on Patients

The analysis outcomes for this study showed that a majority of cancer patients at the Nakuru Oncology clinic experienced different psychosocial impacts of cancer.

These impacts were mostly related to family break ups and loss of friends and relatives. Other minor impacts include stigmatization and limited social participation for the patients (Figure 4 and Table 2).



**Figure 4: Impacts of cancer treatment on the Family**

**Table 2: Impacts of cancer treatment on the Family**

Stage Detected	Impacts of stage detected on social life				
	Family Breakups	Loss of friends and relatives	Limited Participation in social	Negligence	Stigmatization
Stage one	20.0%	14.3%	0.0%	0.0%	0.0%
Stage two	33.3%	57.1%	75.0%	50.0%	100.0%
Stage three	13.3%	28.6%	25.0%	50.0%	0.0%
Stage four	20.0%	0.0%	0.0%	0.0%	0.0%

Various studies have focused on the social impacts of cancer on patients and their families. The findings for the current study derive support from some of the outcomes



reported by authors. For instance, Bhutta, Chopra and Axelson (2010) mention that a cancer diagnosis results to a complex set of issues, including having to deal with physical signs and symptoms from the disease and treatment, facing the illness, and seeking a consoling philosophical, religious and spiritual belief structure or principles that give meaning to life and death. Although majorities of cancers are treatable, many people retain innate fears that any cancer represents suffering, pain and death.

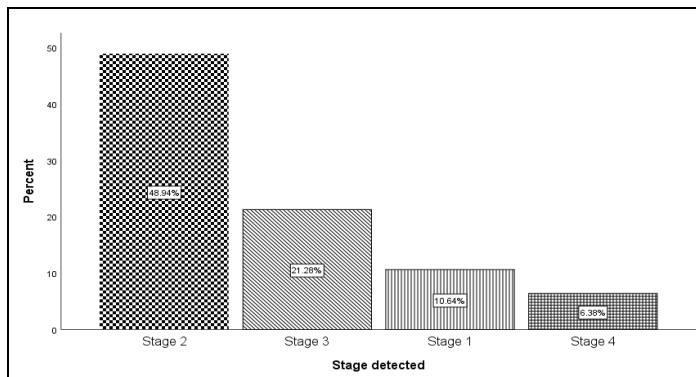


Figure 5: The different stages that cancer is detected

These fears can contribute to a person's reaction to cancer diagnosis. Receiving a cancer diagnosis is associated with a peak of negative feeling and distress for many. Waves of intense emotions comparable to a grief reaction with periods of tranquility are common. Generally, following the early days after receiving the diagnosis, most people are able to develop a constructive plan of action.

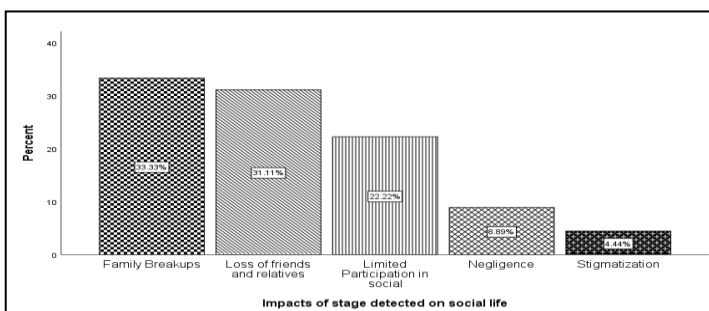


Figure 6: Impacts of the stage cancer is detected on the social life of the individual

Valued physical traits may be lost as weakness and emaciation occur. Patients may be less able to complete normally important personal care routines (e.g., shaving). Others (Su et al., 2017) may no longer recognize an individual as the same person. This can cause patients to feel shame or that they are not lovable. Maintaining patients dignity, respecting modesty, and assisting with personal care are all important supportive care measures. Perhaps one of the most poignant fears that patients encounter is facing the loss of relationships with loved ones. Just as family members anticipate losing the patient, the patient, too, is anticipating separation and loneliness (Worden and Kalemkerian, 2000).

Self-image is an important gauge for psychological and social implications of cancer. Studies carried out by Bellizzi et al. (2012) in this subject for example have identified a negative relation between cancer and body image especially in the adolescence and young adults. This age group is a critical time of worrying about a healthy body image, and a diagnosis of cancer can aggravate this already taxing developmental task. A poor body image can lead to low self-worth and may affect the capability to form healthy peer and close relationships during early adulthood.

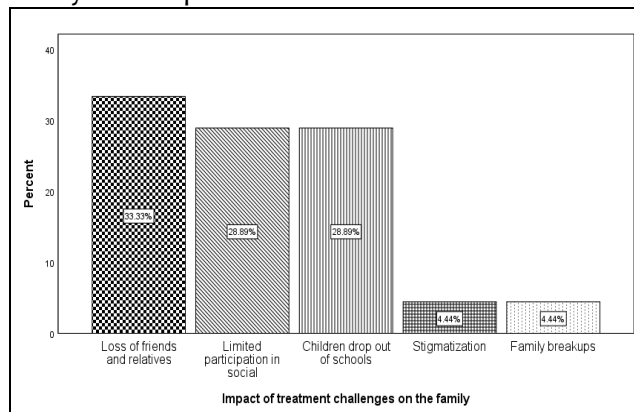
Another contributor to psychosocial implications in the lack of control over a patient's own life. Lower perceived control over one's life has been related to lower treatment adherence in the general adult cancer population (Boinon et al., 2014). Additionally, social impacts of cancer were also related relationships such as partner or family members. The focus group discussions revealed that loss of marriage partners was a significant contributor to cancer related stress.





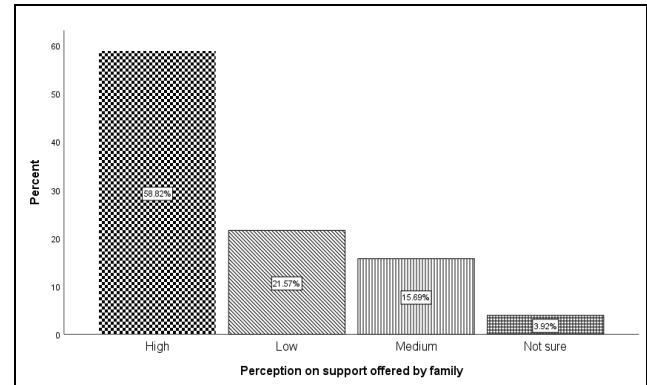
## 1) Support by family members

The results from this study showed that patients received a lot of support from family members (58.82%) while the rest perceived the support from family as medium to low. Family support is an important factor in cancer patients, and the results showed that family support for patients was high for a majority of patients. On the contrary, some of the respondents felt that the support offered by family members was not enough and this had some implications on the patients and family members. Some of the effects reported include loss of relatives and friends (33%), limited social participation (28.8%) and school drop out for children (28.8%). Other minor ones include stigmatization and close family break ups.



**Figure 7: Impacts of cancer treatment challenges on the patients' households**

For cancer patients, the family appears to be the most critical source of support, as shown through both qualitative and quantitative methods (Boinon et al., 2014). Good quality social support can help in enhancing adaptive behaviors in patients. Individuals with strong social relationships have been reported to have lower mortality and morbidity rates from diverse diseases (Boinon et al., 2014).



**Figure 8: Perception on the support given by the family to the cancer patient**

Social support is a complex notion entailing various types: emotional, informational, and practical (Boinon et al., 2014). Emotional type of support involves non-verbal and verbal communication of interest and concern. For individuals with cancer, it has been found to include the expression of interest and love, physical presence, and solidarity. Informational support encompasses the provision of information applied for guidance or advice, for example, medical advice. Practical support refers to the provision of material goods, such as help with daily activities and physical labour.

Several studies have been carried out to show the importance of family in averting psychosocial impacts of cancer on patients (Bellizzi et al., 2012; Boinon et al., 2014). Boinon (2014) reports that higher family support was related to lower levels of depression at baseline and quicker improvement of depression. Support from the spouse is especially important. A previous study reported that greater perceived support from the spouse was associated with lower levels of depression (Boinon et al., 2014). Another study among breast cancer patients aged ≥55 years revealed that support from adult children was also related to less anxiety and depression Mosher et al., 2017. For health professionals, it is important to understand

family interactions during the course of the illness and to provide information about how to improve and maintain enough family support and functionality. In addition, patients with depression might tend to report feeling less supported by their family.

## Conclusion

This study shows that a large number of cancer patients within the Nakuru Oncology clinic incurred cataclysmic level of health expenditure, which significantly led to a reduction of household income. This was seen as a major contributor to poverty since cost of treatment for cancer is unaffordable for the respondents. Socioeconomically disadvantaged cancer patients were particularly susceptible to negative impacts of cancer treatment costs. This was also related the low level of education and having a larger percentage of patients in the informal sector (agriculture and self-employment). The research further showed that there was a significant difference in medical expenditure on a case of 'before and after cancer development'. Through the focused group discussion, the study showed that patients in this clinic incurred costs

through the normal cost of cancer treatment and purchase of other essentials. Patients purchased essentials such as over-the-counter or prescription medicines and dietary supplements; dietary supplements such as tablets and nutritional drinks; and dressings, such as wound dressings, stay dry pads or sanitary wipes. Although majorities of cancers are treatable, many people retain innate fears that any cancer represents pain, suffering, and death. These fears can contribute to a person's response to a new cancer diagnosis. Receiving a cancer diagnosis is associated with a peak of negative mood and distress for many. Waves of intense emotions similar to a grief reaction with periods of calmness are common. Generally, following the early days after receiving the diagnosis, majority of individuals are able to develop a constructive plan of action.

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