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PSYCHOLOGICAL FACTORS ASSOCIATED WITH THE UPTAKE OF CANCER SCREENING SERVICES IN MASINGA SUB COUNTY, MACHAKOS COUNTY, KENYA

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PSYCHOLOGICAL FACTORS ASSOCIATED WITH THE UPTAKE OF SCREENING SERVICES FOR EARLY DETECTION OF CANCER AMONG CLIENTS VISITING MASINGA LEVEL FOUR HOSPITAL OUTPATIENT DEPARTMENT, MASINGA SUB COUNTY, MACHAKOS COUNTY, KENYA

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ABSTRACT

Background: Psychological factors such as stress are known to increase the risk of some cancers. Importantly, screening tests offer a chance to detect cancer at an early stage when successful treatment is most likely. However, successful cancer prevention and control strategy, of which screening is part, hinges on the effective application of what is known about the basics of human behavior and psychological aspects. This study, therefore, aimed at examining psychological factors associated with the uptake of cancer screening in Masinga sub-county, Kenya.

Objective: To assess psychological factors associated with the uptake of cancer screening.

Design: Case-control for quantitative data; Phenomenological for qualitative data.

Setting: Outpatient department, Masinga sub-county hospital.

Subjects: 42 cases (screened) and 116 controls (never screened). Systematic sampling method was used to select the study participants with every 9th person for cases and every 12th for controls. Qualitative data was collected from nine FGDs.

Main outcome measures: Health belief model (HBM) components, cognitive well-being, stress, autonomy and general self-efficacy were used as general psychological variables.

Results: Mean age of cases and controls was 44.3 (± 11.1) and 42.8 (± 14.8) years respectively. Psychological variables that were assessed such as HBM constructs, cognitive well-being, autonomy, general self-efficacy and perceived stress were all positively associated with uptake of cancer screening.

Conclusion: HBM constructs, cognitive wellbeing, perceived autonomy, stress and self-efficacy were associated with cancer screening. Special emphasis should be directed at increasing cancer awareness and dispelling the myths surrounding cancer and cancer screening at all community primary care points.

INTRODUCTION

Psychological aspects such as stress that are known to interact with health behaviors such as cigarette smoking and alcohol intake are known to be related to cancer progression¹. These health behaviors are also intimately linked together by psychological processes such as impulsivity². There is some evidence that psychological factors can affect uptake of cancer screening, for instance variables such as self-efficacy and perceived sense of responsibility towards self can also influence utilization of health services³ in which cancer screening uptake is part. Peralta *et al.*,⁴ also reported that participants who had high self-efficacy, perceived benefits, less barriers to screening and threats to cervical cancer had a significantly greater chance of obtaining a pap smear test every year.

Globally, it is estimated that there were 18.1 million new cancer cases and 9.6 million deaths in 2018; majority of these cases occurring in low-and middle-income countries^{1,5}. In sub-Saharan Africa alone, the proportion of cancer burden is projected to have a greater than 85% increase by 2030⁶ and a substantive global increase of 19.3 million new cancer cases per year by 2025⁷. In Kenya, the International Agency for Research in Cancer¹ report estimated 47,887 new cases of cancer annually with a mortality of 32,987. Psychological factors, in part, has an influence on these documented cancer cases. Cancer is estimated to be the third leading cause of death after infectious and cardiovascular diseases in Kenya; among the non-communicable diseases (NCDs) related deaths, cancer is the second

leading cause of death representing 7% of overall national mortality after cardiovascular diseases¹.

According to WHO¹, between 30-50% of cancer cases are preventable. Prevention of cancer, especially when integrated with the prevention of other related chronic diseases and programs within healthcare such as sexual and reproductive health will offer the greatest public health potential, and the most cost-effective long-term method of cancer control⁵. Moreover, study findings on lifestyle changes in cancer prevention reported that between 90% and 95% of all cancers have their origin in the environmental and lifestyle factors such as tobacco (25-30%), diet (30-35%) and infections like human papilloma virus (15-20%)⁸, which are, in part, effects of psychological involvement. These lifestyle changes, coupled with psychological issues can significantly impact on cancer. Reduction of these risk factors provide significant opportunity to decrease the burden of the disease.

Screening tests, as a secondary prevention, offer a chance to detect cancer at an early stage when successful treatment is most likely. Low screening uptake and late treatment contributed to more than 85% of women's deaths in low and middle-income countries⁹ with death rates varying from country to country. This is due to inadequate access and uptake of screening services for prevention and early detection of the disease¹⁰. Holle and Pharm¹¹ therefore suggest that patients should be screened for cancer to detect precancerous lesions and their subsequent early removal. Notably, American Cancer Society [ACS]¹² highlighted that psychological barriers can

affect an individual's capability for early cancer screening.

Psychological and human behavior aspects are what successful cancer prevention and control strategy hinges on. Effective application of what is known about these basics can therefore immensely improve cancer screening uptake. In Masinga sub-county, accurate information and statistics about these aspects are unknown due to lack of cancer registry, therefore relatively little is known about the extent to which these psychological factors are associated with screening services.

MATERIALS AND METHODS

This study used case-control study design utilizing both qualitative and quantitative data. It was carried out at the outpatient department (OPD) of Masinga sub-county hospital in Machakos county. The monthly workload of this department is about 2,000 adult patients. Cases comprised of those who were aware of cancer screening and had been screened within the last three years while controls comprised of those who were aware and had not been screened. Patients who were 18 years and above who went for various OPD services were included in the study. With the attrition of 30%, the sample size was 13 for cases and 39 for controls. Being that the study run for three months, the study utilized a total sample of 39 cases (13×3) and 117 controls (39×3) at a ratio of 1:3.

Systematic sampling method was used involving a random start chosen from within the first to the k^{th} patient. For cases, k was every 9th person and every 12th for controls.

Semi-structured questionnaire and focus group discussion (FGD) guide were used. The questionnaire contained open-ended, closed-ended and likert type of questions. It comprised of two sections: sociodemographic and psychological factors. Thematic areas were used to develop FGD guide.

Data was entered in Microsoft excel where cleaning and editing was done and then imported to SPSS version 26.0 for analysis. Qualitative data was analyzed thematically. Research permit was obtained from Baraton ethics research committee and permission from Masinga sub county hospital administration. Voluntary and informed consent of the respondents was also sought after explaining the aim of the study and the procedures involved. Confidentiality of the information given was emphasized and the identities of the respondents were protected by using numbers to ensure the principle of anonymity.

RESULTS

The mean age of cases and controls was 44.3 (± 11.1) and 42.8 (± 14.8) years respectively. Cases had majority female 69.0% ($n=29$) while controls had majority males 59.5% ($n=69$). Additional participant characteristics are found in table 1. The response rate was 99% ($n=155$) from the questionnaires. From the focus group discussion, the response rate was 69.2%; nine FGDs were conducted instead of thirteen since saturation had already been reached.

Table 1
Sociodemographic characteristics of the study participants

Variable	Category	Study arm					
		Case		Control		Total	
		n=42	%	n=116	%	N	%
Gender	Male	13	31.0	69	59.5	82	51.9
	Female	29	69.0	47	40.5	76	48.1
Marital status	Married	30	71.4	86	74.1	116	73.4
	Single	2	4.8	11	9.5	13	8.2
	Divorced	5	11.9	6	5.2	11	7.0
	Separated	1	2.4	1	0.9	2	1.3
	Widowed	4	35.7	9	7.8	13	8.2
Education level	None	1	2.4	6	5.2	7	4.4
	Primary	15	35.7	32	27.6	47	29.7
	Secondary	16	38.1	43	37.1	59	37.3
	College or university	10	23.8	35	30.2	45	28.5
Religion	Christian	40	95.2	104	89.7	144	91.1
	Muslim	1	2.4	11	9.5	12	7.6
	Other	1	2.4	1	0.9	2	1.3
Occupation	Unemployed	6	14.3	33	28.4	39	24.7
	Self-employed	27	64.3	55	47.4	82	51.9
	Skilled worker	9	21.4	28	24.1	37	23.4

Association between psychological factors and cancer screening uptake

The areas assessed were health belief constructs, cognitive well-being, stress, autonomy and self-efficacy.

Health belief model (HBM) constructs

Chi square p value results determining the relationship of levels of agreement of HBM constructs between cases and controls are shown in the table below.

Table 2
Chi square results

Variable	Study arm	Rate						Chi square (df)	P value
		Do not Agree		Agree		Strongly agree			
		n	%	n	%	n	%		
Perceived susceptibility	Case	22	52.4	16	38.1	4	9.5	32.023(1)	<0.001
	Control	105	90.5	7	6.0	2	1.7		
Perceived severity	Case	0	0.0	4	9.5	38	90.5	25.502(1)	<0.001
	Control	9	7.8	53	45.7	52	44.8		
Perceived benefits	Case	1	2.4	10	23.8	31	73.8	25.670(1)	<0.001
	Control	39	33.6	38	32.8	36	31.0		

Perceived susceptibility, severity and benefits were significantly different between cases and controls (p values<0.001).

Mann-Whitney U test results

From table 3 (a), the mean scores for cases was significantly higher than that of controls, p <0.05.

Mantel-Haenszel odds ratio results for HBM components Perceived susceptibility OR 2.758, p .022, 95% CI (1.155- 6.585), perceived severity OR 5.720, p .003, 95% CI (1.835- 17.832), perceived benefits OR 2.217, p .029, 95% CI (1.087- 4.520).

Table 3

Mann-Whitney U results for Health belief model (HBM) constructs, Cognitive well-being, Autonomy and Self-efficacy

Items	Mean		Mean difference	Distribution	
	Case	Control	P value	Mann-Whitney U Test P value	
<u>Health belief model (HBM) constructs</u>					
Perceived susceptibility	1.57	1.1	<0.001	<0.001	
Perceived severity	2.9	2.38	<0.001	<0.001	
Perceived benefits	2.71	1.97	<0.001	<0.001	
<u>Cognitive well-being</u>					
Life close to ideal	4.38	2.80	<0.001	<0.001	
Excellent life conditions	4.00	2.19	<0.001	<0.001	
Satisfied with life	4.52	2.54	<0.001	<0.001	
Gotten the important things in life.	4.31	2.54	<0.001	<0.001	
Changing almost nothing if given another chance to live	3.86	2.44	<0.001	<0.001	
<u>Autonomy</u>					
1.	A. I always feel like I choose the things I do. B. I sometimes feel that it's not really me choosing the things I do.	1.476	2.106	<0.001	<0.001

2.	A. My emotions sometimes seem alien to me. B. My emotions always seem to belong to me.	4.524	4.142	<0.001	<0.001
3.	A. I choose to do what I have to do. B. I do what I have to, but I don't feel like it is really my choice.	1.81	2.239	0.002	0.001
4.	A. I feel that I am rarely myself. B. I feel like I am always completely myself.	4.381	4.124	0.003	0.028
5.	A. I do what I do because it interests me. B. I do what I do because I have to.	1.762	2.438	<0.001	<0.001
6.	A. When I accomplish something, I often feel it wasn't really me who did it. B. When I accomplish something, I always feel it's me who did it.	4.548	4.381	0.189	0.063
7.	A. I am free to do whatever I decide to do. B. What I do is often not what I'd choose to do.	1.714	2.33	<0.001	<0.001
8.	A. My body sometimes feels like a stranger to me. B. My body always feels like me.	4.659	4.464	0.059	0.074
9.	A. I feel pretty free to do whatever I choose to. B. I often do things that I don't choose to do.	1.714	2.384	<0.001	<0.001
10.	A. Sometimes I look into the mirror and see a stranger. B. When I look into the mirror, I see myself.	4.833	4.83	0.97	0.916

<u>Self-efficacy</u>				
I can always manage to solve difficult problems if I try hard enough.	3.76	3.32	<0.001	<0.001
If someone opposes me, I can find the means and ways to get what I want.	2.86	2.8	0.573	0.469
It is easy for me to stick to my aims and accomplish my goals.	3.69	3.32	0.001	0.001
I am confident that I could deal efficiently with unexpected events.	2.86	2.32	<0.001	<0.001
Thanks to my resourcefulness, I know how to handle unforeseen situations.	3.05	2.12	<0.001	<0.001
I can solve most problems if I invest the necessary effort.	3.61	3.37	0.022	0.019
I can remain calm when facing difficulties because I can rely on my coping abilities.	3.36	2.98	0.001	0.001
When I am confronted with a problem, I can usually find several solutions.	2.88	2.56	0.003	0.001
If I am in trouble, I can usually think of a solution.	3.67	3.28	<0.001	<0.001
I can usually handle whatever comes my way.	2.98	2.65	0.004	0.002

Cognitive well-being

This was measured using 'satisfaction with life' scale that determined how individuals

evaluated their overall life. Table 4 presents the frequencies of responses for both study arms.

Table 4
Cognitive well-being

Satisfaction with life	Study arm				Total	
	Case		Control			
	n=42	%	n=116	%	N=116	%
Extremely dissatisfied	4	9.5%	32	27.6%	36	22.8%
Dissatisfied	4	9.5%	52	44.8%	56	35.4%
Slightly dissatisfied	6	14.3%	16	13.8%	22	13.9%
Neutral	1	2.4%	0	0.0%	1	0.6%
Slightly satisfied	14	33.3%	13	11.2%	27	17.1%
Satisfied	12	28.6%	1	0.9%	13	8.2%
Extremely satisfied	1	2.4%	0	0.0%	1	0.6%

Mann-Whitney U test results

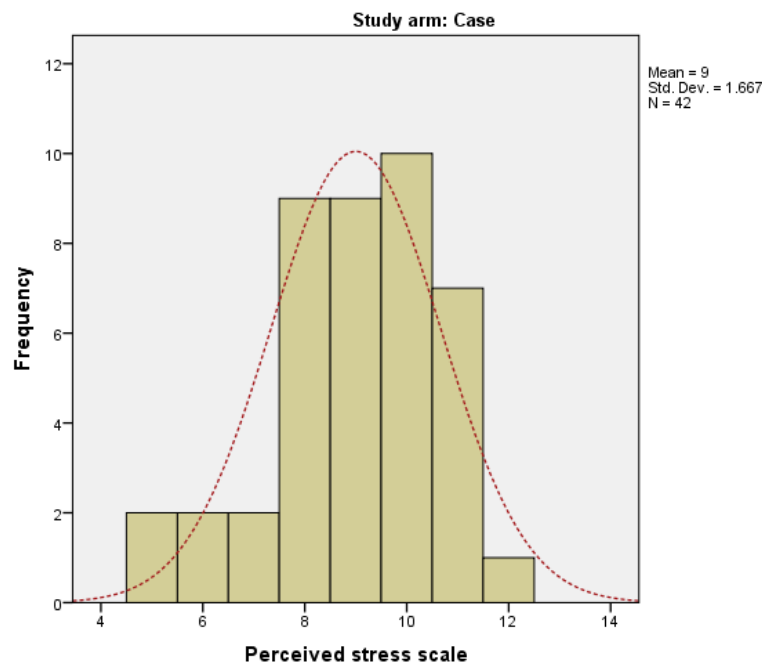
From table 3 (b) that presents the mean difference for cognitive well-being among cases and controls, there is a significant mean difference between cases and controls (p values <0.05).

Mantel-Haenszel odds ratio results for cognitive well-being

OR .440, p <0.001, 95% CI (.338- .572)

Stress

Perceived stress was assessed using a 4-item perceived stress scale. Figure 1 presents mean difference of perceived stress scores (PSS) between cases and controls.



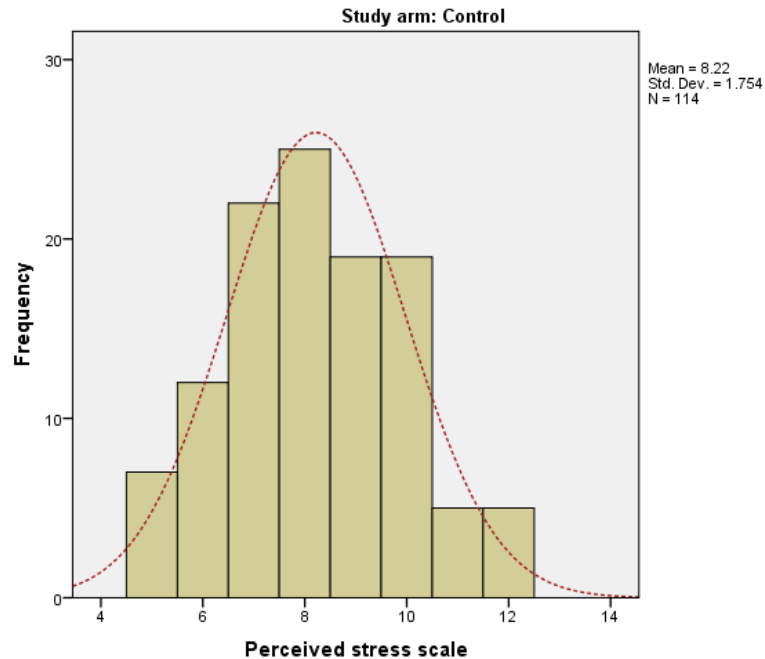


Figure 1: Mean difference

There was significant difference between the mean of perceived stress for cases and controls (t test p value=0.013). The mean score was higher among cases (9.0) than among controls (8.2).

Mantel-Haenszel odds ratio results for perceived stress OR .768, p .016, 95% CI (.620-.951).

Autonomy

This was measured using self-determination scale (SDS). It assessed 'awareness of self' (items 2,4,6,8,10) and 'perceived choice' (items

1,3,5,7,9) as the two constructs of autonomy as shown in table 3 (c).

Mann-Whitney U test results

Table 3 (c) shows mean difference for self-determination scores among the cases and controls. There is significant difference between cases and controls (p values<0.05). Two aspects of 'awareness of self' and one aspect of 'perceived choice' were significantly similar between cases and controls (p values>0.05).

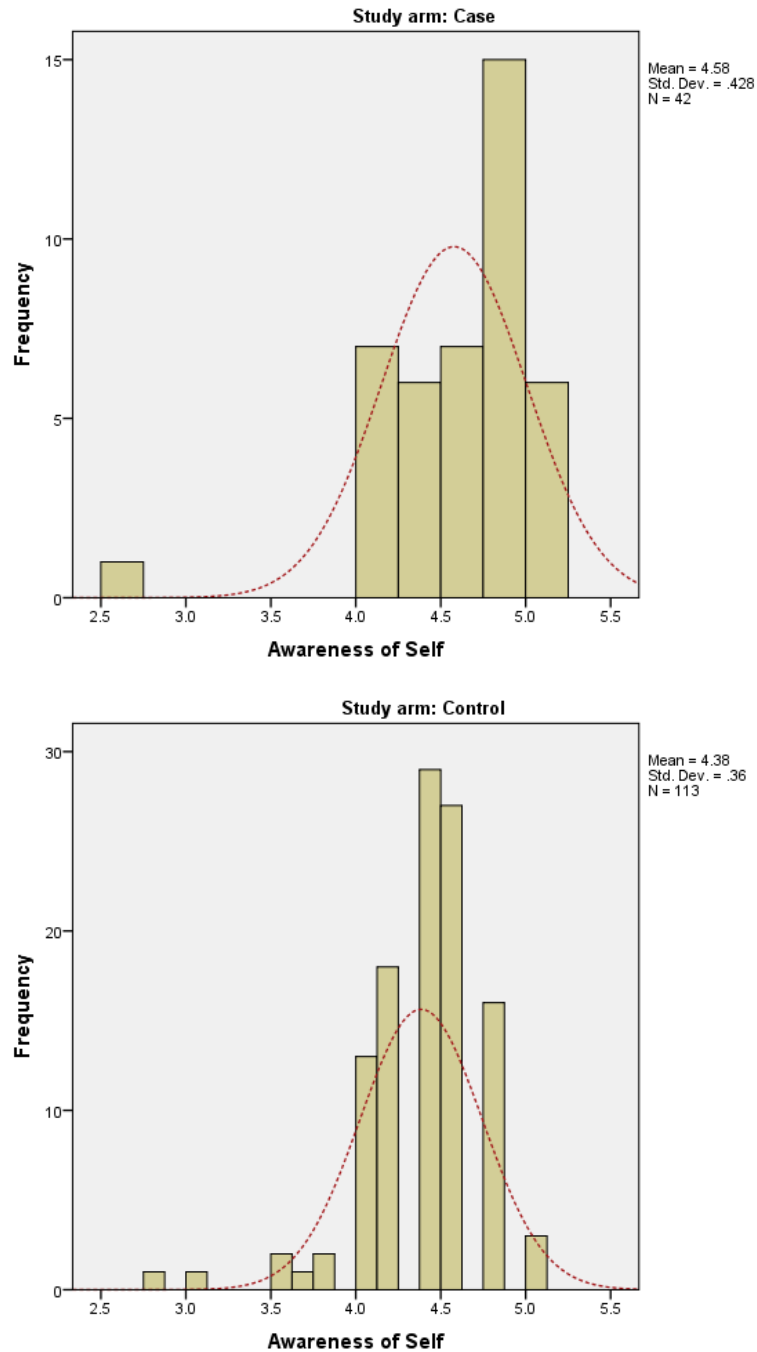


Figure 2: Mean difference of 'Awareness of self' scores between cases and controls

Awareness of self: There was significant difference between the mean of 'awareness of self' scores between cases and controls (t test p

value=0.05). The mean score was higher among cases (4.6) than among controls (4.4).

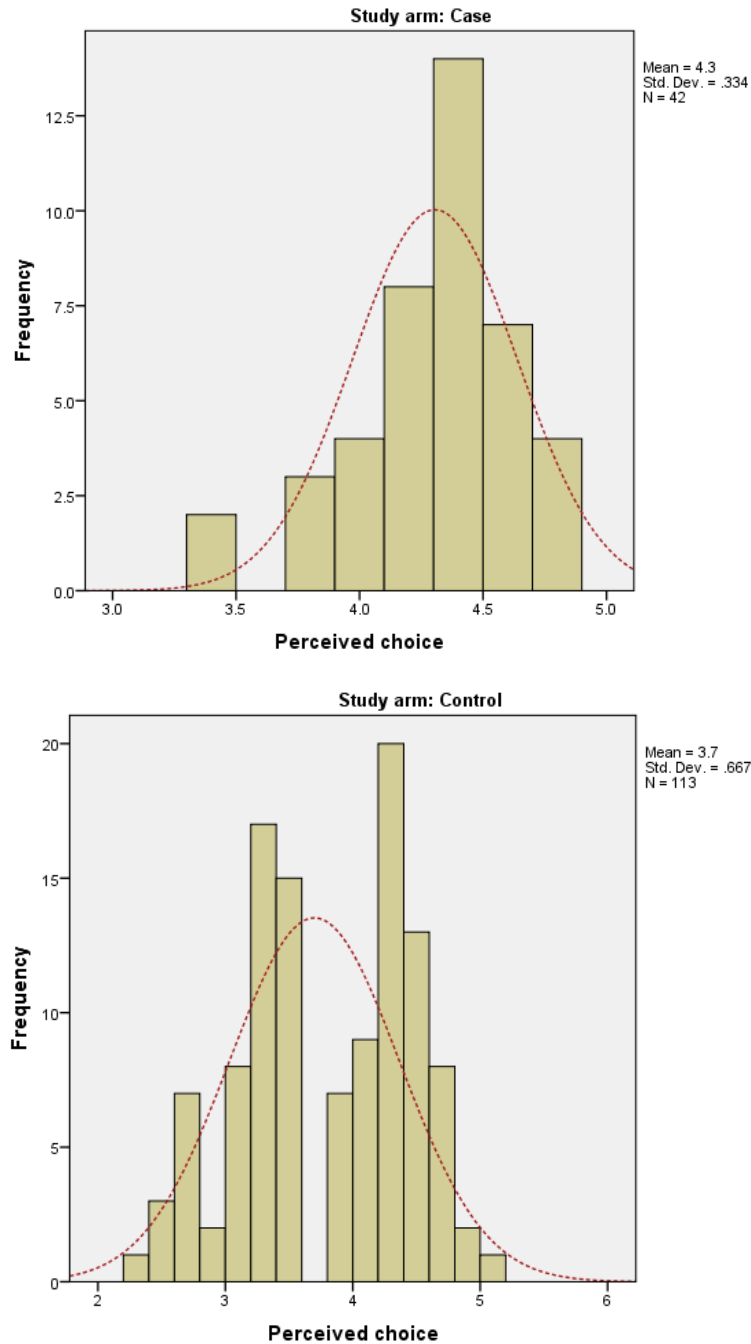


Figure 3: Mean difference of 'Perceived choice' scores between cases and controls

Perceived choice: There was significant difference between the mean of 'Perceived choice' scores between cases and controls (t test p value<0.001). The mean score was higher among cases (4.3) than among controls (3.7). Mantel-Haenszel odds ratio results

'Perceived choice': OR .119, p <0.001, 95% CI (.048- .300) and 'awareness of self' scores OR .172, p .006, 95% CI (.049- .602).

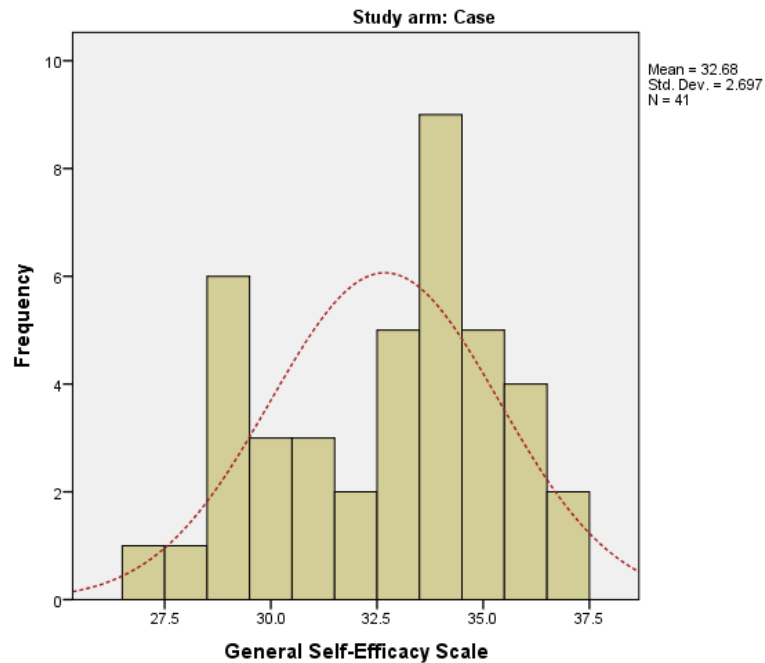
Self-efficacy

General self-efficacy scale was used to determine the scores.

Mann-Whitney U test results

From table 3 (d) presents mean differences for cases and controls. There is significant

difference between cases and controls (p values<0.05). 'If someone opposes me, I can find the means and ways to get what I want' were significantly similar between cases and controls (p values=0.469).



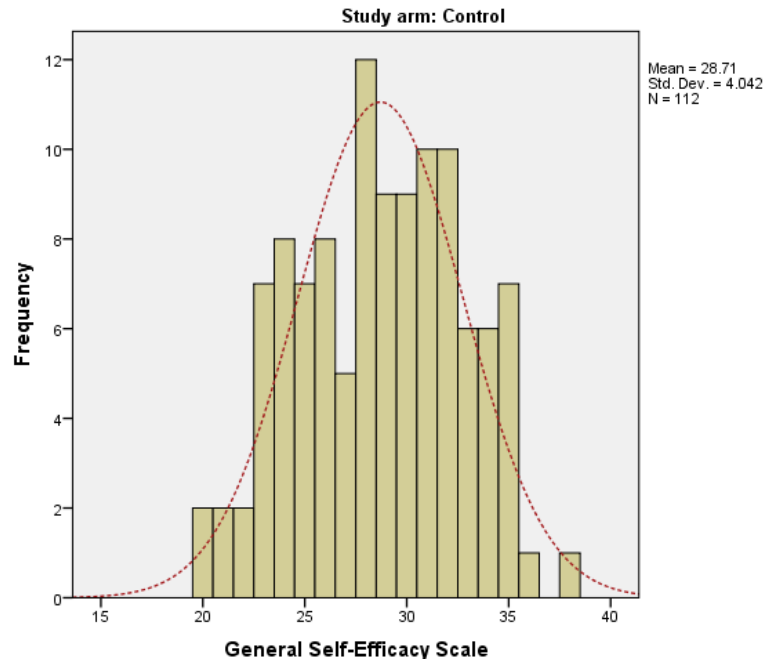


Figure 4: Mean difference between cases and controls for general efficacy scores

There was significant difference between the mean of 'General Self-Efficacy Scale' scores between cases and controls (t test p value < 0.001). The mean score was higher among cases (32.7) than among controls (28.7). Mantel-Haenszel odds ratio results.

General Self-Efficacy OR .727, P < 0.001, 95% CI (.638- .828).

Value-belief system

Two-point-four percent (n=1) of cases and 19.0% (n=22) controls reported that their value-belief system was somewhat a hinderance to cancer screening. Fear of exposing nakedness, fear of penetrating equipment that enlarge vagina/anus, religion, belief that cancer is a disease for specific groups, contradicting opinions by family members, eating good food fully prevents cancer and therefore no need for screening, only the sick should be screened, screening does not prevent cancer, and fear of being sexually abused by medics during screening were some of the hinderances.

Qualitative data

The following themes and sample of narratives were identified in FGDs for:

Facilitators to cancer screening among cases.

Anxiety- "I remember losing two friends to cancer. This made me so nervous and since then, I do go for screening every three years." ...participant 9 of FGD 1.

Stress- "My brother is currently suffering from colorectal cancer. This has been stressing me because I'm told cancer run in families." ...participant 7 of FGD 1.

Positive perception and attitude- "You see in the news daily how cancer kills the ordinary people and the wealthy politicians. I gave it a deep thought and finally I made that decision because after all it is me who will benefit." ...participant 4 of FGD 1.

Motivation- "Motivational stories are common during the world cancer days. This was the source of my inspiration." ...participant 2 of FGD 2.

Barriers to cancer screening among controls.

Negative perception and fear- "I have a friend who once told me that her boyfriend complained of an enlarged vagina after cervical cancer screening.

The speculum used allegedly caused all these mess. Since then I've never liked how cervical cancer screening is done. ...participant 17 of FGD 6.

Negative attitude- *"Well, anybody who is going to be screened especially for cervical cancer is assumed to be engaged in risky sexual behavior which has a negative connotation from the public, so to avoid all these, I resist any attempts to be screened."* ...participant 6 of FGD 8.

Embarrassment- *"A friend once told me how they did prostate cancer screening on him and how embarrassing it was."* ...participant 11 of FGD 2.

DISCUSSION

Delays in seeking care, diagnosis and commencing treatment add to the lag time between disease onset and treatment which ultimately impact on survival significantly. Delays in seeking care were reported in the past at Kenyatta national hospital ¹³ which had similar findings with another study done at Moi teaching and referral hospital ¹⁴. Patient delays may be attributed to personal factors such as psychological issues, unfavorable socioeconomic backgrounds and healthcare system factors. In general, fear of positive result, anticipation of pain, poor understanding of the procedure, anxiety, psychological distress and feeling of embarrassment are all psychological issues that can determine adherence to cancer screening. This study therefore aimed at examining the association between the use of cancer screening and psychological factors.

In this study, Mantel-Haenszel tests revealed that cancer screening is associated with cognitive well-being, perceived autonomy and self-efficacy. It was also noted that an increase in stress was associated with an increase in screening uptake. These findings are consistent with another study ¹⁵ which found a significant positive correlation between self-

efficacy and cancer preventive behavior. Notably, perceived susceptibility, perceived severity and perceived benefits were significant and increased the likelihood of being screened. A study by Dibarloo *et al.*, ¹⁶ also found that perceived cancer severity and perceived screening benefits were better predictors of breast self-examination practice. Most of the previous local studies concentrated on illness-specific rather than general factors. For instance, a study done in Kisumu ¹⁷ revealed that those who felt were not susceptible to cancer were more likely not to go for cancer screening. The following were the facilitators to screening uptake among cases during FGDs: anxiety, stress, positive perception and attitude and motivation; while barriers experienced by the control group were: negative perception and fear, negative attitude and embarrassment.

In conclusion, psychological factors that were found to be positively associated with uptake of cervical cancer screening were cognitive well-being, perceived autonomy, perceived stress, self-efficacy, perceived susceptibility to cancer, perceived benefits of cancer screening and perceived severity of cancer.

REFERENCES

1. World Health Organization. International agency for research on cancer: Kenya fact sheets. Globocan. 2018.
2. Klein, W.M.P., Bloch, M., Hesse, B.W., McDonald, P.G., Nebeling, L., & O'Connell, M. E. *et al.* Behavioral Research in Cancer Prevention and Control: A Look to the Future. *Women's Health*. 2014; Rockville: Maryland; 46(3): 303-311. <https://10.1016/j.amepre.2013.10.004>
3. Lagerlund, M., Sontrop, J.M. & Zackrisson, S. Psychosocial factors and attendance at a population-based mammography screening program in a cohort of Swedish women. 2014; 14(33). <https://doi.org/10.1186/1472-6874-14-33>

4. Peralta, A.M., Holaday, B. & McDonell, J. R. Factors affecting Hispanic women's participation in screening for cervical cancer. *J Immigrant Minority Health*. 2014; <https://10.1007/s10903-014-9997-7>
5. World Health Organization. Guide to cancer early diagnosis. <https://creativecommons.org/licenses/by-nc-sa/3.0/igo..2017>.
6. Bello, I.O.M., Odedina, F., Rebbeck, T.R., Harford, J., Dangou, J.M., & Denny, L. et al. Challenges and opportunities in cancer control in Africa: a perspective from the African organization for research and training in cancer. 2013; 14: e142-51.
7. World Health Organization. Key prevention and control interventions for reducing cancer burden in the WHO African region. 2012.
8. Anand, P., Kunnumakara, A.B., Sundaram, C., Harikumar, K.B., Tharakan, S.T., & Lai, O.S. et al. Cancer is a Preventable Disease that Requires Major Lifestyle Changes. 2008; <https://10.1007/s11095-008-9661-9>.
9. Wittet, S., Goltz, S. & Cody, A. Progress in Cervical Cancer prevention the CCA Report Card. 2015.
10. Jemal, A., Bray, F., Forman, D., O'Brien, M., Ferlay, J., & Center, M. et al. Cancer burden in Africa and opportunities for prevention. *American cancer society journals*. 2012; 118(18), 72-84. <https://10.1002/cncr.27410>
11. Holle, L. & Pharm, D. Cancer screening and prevention. In K. J. Weddle, D. M. Erdman, & M. Musser, *Oncologic/hematologic care*. 2017.
12. American Cancer Society. *Cancer Facts & Figures*. 2009.
13. Onyango, J., & Macharia, I. Delays in diagnosis, referral and management of head and neck cancer presenting at Kenyatta National Hospital, Nairobi. *East Afr. Med. J*. 2006; 83(4): 85-91 <https://10.4314/eamj.v83i4.9421>
14. Were, E., Nyaberi, Z. & Buziba, N. Perceptions of risk and barriers to cervical cancer screening at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya. *African health sciences journal*. 2011; 11(1), 58-64.
15. Sakhvidi, M.J.Z., Zare, M., Mostaghaci, M., Mehrparvar, A. H., Morowatisharifabad, M.A. & Naghshineh, E. Psychosocial predictors for cancer prevention behaviors in workplace using protection motivation theory. *Advances in preventive medicine*. 2015; 467498, 1-9. <http://dx.doi.org/10.1155/2015/467498>
16. Didarloo, A., Nabilou, B. & Khalkhali, H.R. Psychosocial predictors of breast self-examination behavior among female students: an application of the health belief model using logistic regression. *Public Health*. 2017; 17(861). <https://doi:10.1186/s12889-017-4880-9>
17. Morema, E.N., Atieli, H.E., Onyango, R.O., Omondi, J.H. & Ouma, C. Determinants of cervical screening services uptake among 18-49-year-old women seeking services at the Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu, Kenya. *Health services research*. 2014; 14(335). <http://www.biomedcentral.com/1472-6963/14/335>