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RESEARCH ARTICLE

Factors Associated with Suicidal Ideation, and Attempt Among Cancer Patients in Ayder Comprehensive Specialized Hospital: Cross-Sectional, Mekelle, Ethiopia

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Abstract:

Background:

Cancer patients are at high risk for suicide, particularly, when they are informed about the cancer diagnosis. However, there is a limited study in Ethiopia therefore, assessing suicidal ideation, attempt, and its associated factors are needed for intervention.

Methods:

An institutional-based cross-sectional study was conducted from March to June 2019 at Ayder comprehensive specialized hospital with a total of 297 participants. Suicide module of the World Mental Health (WMH) survey initiative version adopted from the World Health Organization (WHO) and used to assess suicidal ideation and attempt. Binary logistic regression analysis employed to identify factors associated with suicidal ideation and attempt. Odds ratio with 95% CI and P-value <0.05 was applied to identify significantly associated factors.

Results:

The lifetime prevalence of suicidal ideation and the attempt was found to be 27.9% [95%CI (22.3, 31.6)] and 8.4% [95%CI (5.2, 10.3)] respectively. Being female [AOR= 2.23, 95%CI (1.27, 3.92)], stage IV cancer [AOR=2.08, 95%CI(1.47, 3.81)], having depression and anxiety [AOR=2.31, 95%CI(1.24,4.32)], poor social support [AOR=3.70, 95%CI(2.01,6.78)], and level 4 performance status [AOR=3.73, 95%CI(1.71, 8.13)] were the factors associated with lifetime suicidal ideation. While being in level 4, performance status was also significantly associated with suicidal attempt.

Conclusion:

Both suicidal ideation and attempt among cancer patients are high. The suicidal ideation had a statistical association with sex, stage of cancer, having depression and anxiety, social support, and level of performance. Therefore, health education for early screening and treatment for depression and anxiety, and giving social support are crucial for the reduction of suicide.

Keywords: Suicidal ideation, Suicidal attempt, Cancer, Depression, Social support, Anxiety.

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1. INTRODUCTION

Suicide means the act of a person intentionally causing his or her death. A suicide attempt is a known habitual act with the nonfatal outcome that is deliberately initiated and performed by the individual [1,2]. Cancer is a disease with abnormal cells growth, reproducing uncontrollably and invading nearby tissue by spreading to other parts of the body through bloodstreams and lymphatic systems. Worldwide, about 25 million people are living with cancer. Each year, 7 million people die from it. The World Health Organization (WHO) estimated in 2011 that 34% of the Ethiopian population is dying from a non-communicable disease, with a cancer prevalence of 40%[3 - 6].

Cancer patients are at high risk for suicide, particularly when they are informed about the cancer diagnosis or hospitalized for cancer treatment [7]. The risk of attempted and completed suicide among cancer patients is much higher than the general population [8,9]. Various studies have reported that

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the diagnosis of cancer is two to five times the risk factor for suicide when compared to the general population [5,6,9,10], with 8.5% to 26% of terminal cancer patients have a higher level of the "desire for hastened death [11].

A study conducted in the United Kingdom showed that 7.8% of cancer outpatients have suicidal ideation [12], while 10.9% of breast cancer patients undergoing surgery in Korea [9], and 8.6% of terminal cancer outpatients in Japan [13] have suicidal ideation, with its variation, ranging from 0.8 to 71% in non-psychiatric populations of cancer patients compared to 1.1 and 19.8% suicidal ideation in the general population [14].

The finding of this study shows that 15.3% cancer inpatients of Chinese general hospitals in the Tianjin area reported having suicidal ideation the previous month [7]. The prevalence found in Chinese cancer inpatients is similar to that reported in other cohorts, including the 17.7% prevalence in a population-based sample of American cancer patients [15], the 15% prevalence in Japanese patients with unrespectable lung cancer in Japan [13], the 18.1% prevalence in Chinese gynecological cancer patients [7], Korean stomach cancer survivors (34.7%)[9], and another study in Korea 20.1% [11] have suicidal ideation. While a study conducted in Turkey showed the prevalence of suicide attempts in cancer patients was 12.74% [5].

A study was carried out in Turkey including 102 patients who were under treatment in the oncology department and the control group included 100 individuals with similar socio-demographic features shows suicide attempts were correlated with depression, anxiety, low level of perceived social support, and advanced stage cancer. Multi-center study performed in Korea showed that poor performance status and having co-morbidity were associated with suicidal ideation and attempt. Performance Status (PS) is a standard functional classification in oncology research and practice. Performance status scores are based on a patient's ability to perform daily activities and are designed to provide a measure of impairment as a function of cancer. Poor Performance status (defined as Performance status on Eastern Cooperative Oncology Group (ECOG) 2-4 on a 0-4 scale) was determined among cancer patients.

A survey of consecutive patients who attended the outpatient clinics of a regional cancer center in Edinburgh, United Kingdom, shows significant emotional distress, substantial pain, and older age, were associated with a positive response for suicide. Alcohol use, previous suicide attempts, metastatic cancer, palliative care, being male, single, unemployed, diagnoses of more severe types of cancer were significantly associated with suicidal ideation. Additionally, a higher risk of suicidal behavior or ideation was observed during the first 5 years following the initial diagnosis of cancer, and with emotional distress such as depression, hopelessness, anxiety, post-traumatic stress disorder [2, 5, 11, 12, 14, 16 - 18].

Male patients seem to have a higher suicide risk than females [13]. Cohort studies were carried out among Danish cancer patients which revealed the risk of suicide increase immediately after cancer diagnosis [17 , 19]. Commuting suicide was highest during the first 3 months after the cancer diagnosis for men and from 3 month to 1 year after the diagnosis for women [19].

Patients with terminal cancer have the highest level of hopelessness [15], a powerful predictor of suicidality in cancer patients [8]. In some previous studies, cancer site is also reported to be associated with an increased risk of suicidality [20 , 21].

Despite the rapidly increasing morbidity of cancer [2], to the best of our knowledge, there have been no published studies on the prevalence and associated factors of suicidality among cancer patients in Ethiopia. Therefore, this study assesses the prevalence of Suicidal ideation, attempt, and associated factors among cancer patients.

2. METHODS AND MATERIALS

2.1. Study Design and Area

Institutional based cross-sectional study was conducted from March to June 2019, at Ayder comprehensive specialized hospital, Mekelle, Tigray, Ethiopia. Ayder comprehensive specialized hospital is one of the biggest teaching and referral hospitals in the Tigray region.

2.2. Sampling Technique and Sample Size Determination

We surveyed the cancer patients who are available during the study period. The total numbers of participants were 297 cancer patients available during the data collection period. Data were collected by psychiatric nurses with interviewing clients by using a semi-structured questionnaire and clinical factor-related questioners.

2.3. Operational Definitions

2.3.1. Suicidal Ideation

Is defined as if the respondent answers the question have you ever seriously thought about suicide? If the answer is yes, the respondent has suicidal ideation.

2.3.2. Suicidal Attempt

Is defined as if the respondent answers the question, have you ever attempted suicide? If the answer is yes, the respondent has a suicidal attempt.

2.3.3. Depression and Anxiety

Hospital Anxiety and Depression Scale (HADS) score ≤ 10 shows no or borderline depression or anxiety and score $\geq$ shows the presence of depression and anxiety.

2.3.4. Social Support

Individuals who scored ≥ 9 (moderate and strong social support) on the Oslo 3-item social support scale.

2.3.5. Current Substance Use

Use of at least one of the specified substances within the last 3 months.

2.3.6. Ever Substance Use

Use of at least one of the specified substance once in their lifetime.

2.3.7. Comorbidity Medical Illness

The presence of other diagnosed medical disorder with cancer.

2.3.8. Performance Status

Is defined as *Eastern Cooperative Oncology Group (ECOG)* score 0= no symptoms, 1= mild symptoms, 2=spend 50% or less of the day time in bed due to symptoms, 3= spend 50% or more of the day time in bed due to symptoms, 4= spend the entire day in bed.

2.4. Data Collection Instrument

The presence of suicidal ideation and attempt among cancer patients was assessed by using the World Mental Health (WMH), adapted from the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Depression and Anxiety were assessed using HADS (Hospital Anxiety and Depression Scale).

Social support was assessed by using the Oslo-3 social support scale. Performance status was assessed using the Eastern Cooperative Oncology Group (ECOG). A semi-structured questionnaire was used to collect socio-demographic characteristics and some clinical factors.

2.5. Data Collection Tools and Quality Controls

Data was collected by interviewing patients during a routine follow-up visit. Training for data collectors was given on how to collect data. A pre-test was conducted on 5% of the sample size. The collected data were checked daily for completeness and consistency.

2.6. Data Processing and Analysis

The coded data were entered, checked, and cleaned with Epi data 3.1 and analyzed using Statistical Package for the Social Sciences (SPSS) version 20. Descriptive summary using frequencies, percentages, and graphs were used to present study results. Bivariate analysis was done for Crude Odds Ratio (COR) and multivariate analysis was employed to calculate Adjusted Odds Ratio (AOR).

The strength of the association was presented by the odds ratio with a 95% Confidence Interval (CI). P-value < 0.05 was considered statistically significant in our study.

3. RESULTS

3.1. Socio-Demographic Characteristics

A total of 297 cancer patients were included in the study with a response rate of 98%. Among respondents, 150(50.5%), 227(76.43%), 244(82.13%), and 184(61.95%) were male, orthodox, Tigrian, and married respectively (Table **1**).

3.2. Clinical Characteristics of the Respondents

Of the participants, 23(7.8%), 132(44.4%), 59(19.9%), and 83(27.9%) of respondents were found to have stage I, II, III, and IV cancer, respectively. More than half of study participants; 184(61.95%) had a duration of illness ≤ 1 year. One hundred eighteen (39.7%) of participants were on chemotherapy treatment (Table **2**). Regarding the type cancer, 46(15.43%) of participants had breast cancer (Fig.**1**).

3.3. Prevalence of Suicidal Ideation and Attempt

The prevalence of suicide ideation and attempt among 297 respondents was 83(27.9%) and 25(8.4%), respectively. Of the respondents, 28(37.73%), and 8(32.0%) reported to have suicide ideation, and attempted for ≤ 6 months, respectively (Table **3**).

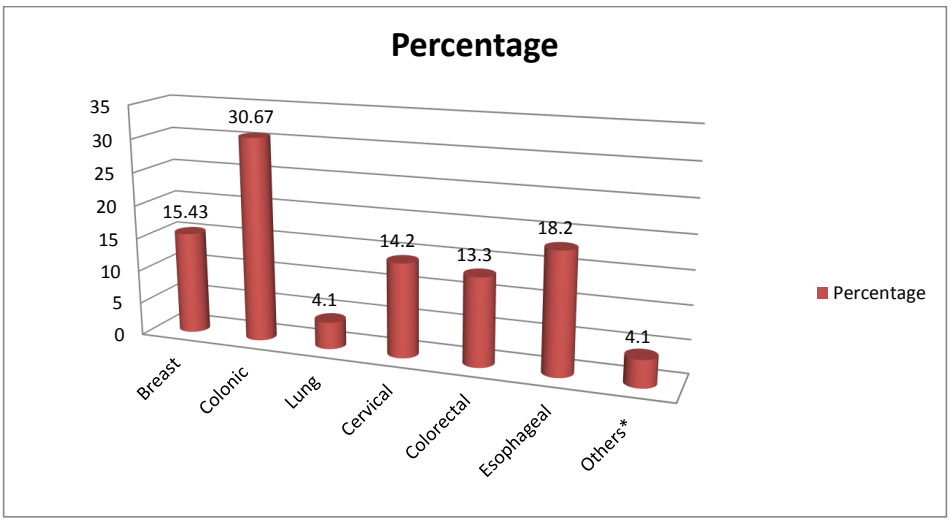

Fig. (1). A graph showing the percentage distribution of type of cancer attending at Ayder referral comprehensive specialized hospital, Mekelle, Ethiopia, 2019.

Table 1. Distribution of by socio-demographic characteristics among patients with cancer at Ayder comprehensive specialized hospital (n=297), Mekelle, Ethiopia, May 2019.

Variables	Category	Frequency(n=297)	Percent (%)
Age	18-27	44	14.8%
	28-37	68	22.9%
	38-47	78	26.2%
	>=48	107	36.1%
Sex	Male	150	50.50
	Female	147	49.50
Religion	Orthodox	227	76.43
	Muslim	58	19.52
	Other	12	4.05
Ethnicity	Tigrigna	244	82.13
	Amhara	32	10.17
	Afar	23	7.70
Marital status	Single	54	18.18
	Married	184	61.95
	Divorced	38	12.79
	Widowed	23	7.08
Education status	Non -educated	18	6.10
	Reading and writing	97	32.65
	Primary	78	26.26
	Secondary	45	15.13
	Diploma and above	59	19.86
Occupation	Unemployed	25	8.41
	Governmental	60	20.21
	Private	110	37.04
	Farmer	42	14.14
	Student	48	16.16
	Other	12	4.04
Living status	With family	238	80.13
	Alone	59	19.87
Monthly income	<1500	78	26.26
	1500-4000	75	25.25
	4001-7000	96	32.33
	>7001	48	16.16

Table 2. Distribution of cancer patients by clinically related factors at Ayder comprehensive specialized hospital; May 2019 (n= 297).

Variables	Category	Frequency(n=297)	Percent (%)
Type of treatment	Chemotherapy	118	39.70
	Surgery	122	41.10
	Combined	57	19.20
Duration of illness	≤1years	184	61.95
	1-5years	90	30.30
	≥5years	23	7.75
Duration of treatment	≤1month	21	7.10
	1-3month	40	13.46
	3-6month	114	38.37
	6-12month	92	30.97
	≥12month	30	10.10
Do you have pain	Yes	168	56.56
	No	129	43.44
If yes did it interfere with daily activity	Yes	63	37.5
	No	105	62.5
Comorbid medical illness	Yes	38	12.80
	No	259	87.20
Family history of suicide	Yes	31	10.43
	No	266	89.57
Depression and anxiety	No, and Borderline*	25	8.42
	Has depression and anxiety	272	91.58

(Table 2) contd.....

Variables	Category	Frequency(n=297)	Percent (%)
Ever use substance	Yes	43	14.47
	No	254	85.53
Which substance?	Alcohol	20	46.51
	Cigarette	9	20.93
	Chat	10	23.26
	Other	4	9.30
Ever use the substance within this three month	Yes	29	9.76
	No	268	90.24
Which substance	Alcohol	12	41.37
	Chat	13	44.84
	Other	4	13.79
How many people are you so close to counting on them during great personal problem?	None	32	10.74
	1-2	132	44.45
	3-5	112	37.71
	≥5	21	7.10
How much interest do people show in what you do?	very little	30	10.10
	Little	52	17.50
	Uncertain	21	7.10
	Some	122	41.10
	A lot	72	24.20
How easy is to get practical help from neighbors if you should need it?	Very difficult	50	16.82
	Difficult	70	23.57
	Possible	58	19.53
	Easy	84	28.30
	Very easy	35	11.78
Oncology performance status	Fully active	88	29.63
	Restricted in some	148	49.83
	50% or more working hour	40	13.47
	Limited activities	21	7.10

Table 3. - Clinical characteristics of cancer patients at Ayder comprehensive specialized hospital (n= 297), Mekelle, Ethiopia, May 2019.

Variables	Category	Frequency(n=146)	Percent (%)
Ever serious thought about commuting suicide	Yes	83	27.94
	No	214	72.06
Duration of ever serious thought	<=6monthg	28	33.73
	6-12month	38	45.78
	1-5years	10	12.05
	>5years	7	8.44
Ever thought of suicide within this 1 month	Yes	17	5.72
	No	280	94.23
Ever made a plan for commuting suicide	Yes	29	9.76
	No	268	90.23
Duration of an ever made plan for commuting	<6month	12	41.37
	6-12month	17	58.63
Ever attempt of suicide	Yes	25	8.42
	No	272	91.58
Method used	Hanging	6	24.0
	Poisoning	10	40.0
	Jumping from a high place	9	36.0
Duration of ever attempting suicide	<=6month	8	32.0
	6-12month	10	40.0
	>5years	7	28.0
Number of suicide attempted	Once	14	56.0
	Twice	11	44.0
Ever attempt suicide with this 1 month	Yes	7	2.35
	No	290	97.65
Reason for attempting suicide	Economic problem	2	8.0
	Death in the family	5	20.0
	Mental illness	8	32.0
	Physical illness	10	40

3.4. Bivariate Analysis

On bivariate logistic regression, sex, stage of cancer, having pain, depression and anxiety, social support, and performance status were statistically significant at p-value < 0.05 for suicidal ideation and attempted into multivariate binary logistic regression analysis.

3.5. Multivariate Analysis

During the multivariate analysis, sex, stage of cancer, having depression and anxiety, social support, and performance status were found to be statistically significant. Being female was more than two times more likely to have suicidal ideation as compared to male patients with the odds of [AOR=2.23, 95%CI (1.27, 3.92)]. Current stage IV cancer was two times more likely to have suicidal ideation as compared to stage I cancer patients with the odds of [AOR=2.08, 95%CI (1.47, 3.81)] (Table **4**).

4. DISCUSSION

Cancer is associated with an increased rate of suicidal acts, suicidal attempts, and suicidal ideation. This leads to commuting complete suicide. The prevalence of suicidal ideation and attempt was 27.9% 95%CI [22.3-31.6], and 8.4% 95%CI [5.2-10.3], respectively. The prevalence of suicidal ideation was higher than the result from studies in the United Kingdom 7.8%[10], Korea 10.9, and 20.1[7,9], Japan 8.6%[14], and 15%[15], Chinese 15.3%[5], and 18.1% [20] the United States 17.7%[18], and lower than a study conducted in Korean 34.7%[7]. The finding of suicidal ideation was lower than the study conducted in Turkey at 12.74%[3].

The prevalence difference in these studies may be due to the difference in sampling methods and design (*i.e*., case-control, correlation), in the type of cancer (*i.e*., patients with one type of cancer only *vs*. various types of cancer), and the study settings (*i.e*., institutional-based vs. community-based), and in developed countries like Turkey screen early for suicide which gives an increase in prevalence.

Regarding factors associated with suicidal ideation, the result of this study shows that being female was 2.23 times more likely to have suicidal ideation when compared to males. This finding was supported by studies conducted in Korea (26). This might be because females have high suicidal ideation than male counterparts as supported by DSM 5 and other psychiatry books.

The odds of suicidal ideation among stage IV cancer patients were found to be 2.08 times more likely to have suicidal ideation when compared with stage I cancer. This finding was in line with the study conducted in Turkey [3], and Japan(27). This could be due to as the stage of the disease progresses the patient becomes hopeless and end the hope of living.

Patients having depression and anxiety were 2.31 times more likely to have suicidal ideation as compared with those who don't have borderline depression and anxiety. This finding was in line with various studies like the study conducted in China (20), Japan(15), and(14), USA(28), and the UK (12). This could be due to patients having depression and anxiety was at high risk of suicidal ideation.

Table 4. Bivariate and multivariate logistic regression results for factors associated with suicidal ideation among cancer patients at Ayder Specialized Comprehensive Hospital, April 2019 (n= 297).

Explanatory Variables	Suicidal ideation		COR (95% CI)	AOR (95% CI)
	Yes	No		
Sex				
Male	40	84	1.00	1.00
Female	107	66	3.40(2.09,5.93)***	2.23(1.27,3.92) **
Stage of Cancer				
Stage I	9	14	1.003	1.00
Stage II	59	73	1.70(1.03,2.73)*	1.11(0.56,1.98)
Stage III	19	40	0.73(0.16, 3.40)	0.47(0.24,0.86)
Stage IV	60	23	22(2.04,5.80)***	2.08(1.47,3.81)**
Do you have pain				
Yes	93	75	1.72(1.08,2.73)*	1.53(0.82,2.84)
No	54	75	1.00	1.00
Depression and Anxiety				
No, and Borderline	32	74	1.00	1.00
Have depression and anxiety	115	76	2.65(1.60,4.35) ***	2.31(1.24,4.32) **
Social support				
Yes	41	108	1.00	1.00
No	106	42	6.64(4.00,11.03)***	3.70(2.01,6.78)***
Oncology performance status				
Fully active	26	62	1.00	1.00
Restricted in some	24	124	2.16(3.60, 9.51)	1.47(0.82, 2.66)
50% or more working hour	20	20	1.38(0.74, 2.55)*	1.45(0.67, 3.12)

(Table 4) contd.....

Explanatory Variables	Suicidal ideation		COR (95% CI)	AOR (95% CI)
	Yes	No		
Limited activities	8	13	8.09(4.39, 14,92)*	3.73(1.71, 8.13)**

The odds of suicidal ideation among participants with poor social support were found to be3.7 times higher as compared to participants with good social support. This finding was supported by studies conducted in China (20), and Canada (29). Social support is one of the protection factors for any mental illness including depression. Therefore those who lack social support were at high risk of depression which leads to suicidal ideation.

Participants with limited performance status were 3.73 times more likely to develop suicidal attempts and ideation as compared with those having fully active status. This finding was in line with a study conducted in the USA(28), Japan (14), UK (12), Canada (29), and Korea(9). This might be due to the reason that a patient who was actively engaging in their daily life becomes dependent on others and they feel hopeless and thinking of ending their life.

CONCLUSION

The prevalence of suicidal ideation and attempt among cancer patients was found to be high, indicating how suicide in cancer patients is a public health problem. Being female, stage IV cancer, having depression and anxiety and lack of social support was associated with suicidal ideation while poor performance status has been associated with suicidal attempt and ideation. Therefore those patients have to find out professional help in early screening and treatment for depression and anxiety, giving social support, and health education on the identification of cancer before progression, especially on females, is crucial for the reduction of suicide.

LIMITATIONS

This study was a cross-sectional study design that cannot show the temporal cause-effect association between factors and suicide. Since this study surveys the whole patient during the study period its default to generalize outside of the study area.

LIST OF ABBREVIATIONS

AOR	=	Adjusted Odds Ratio
CI	=	Confidence Intervals
COR	=	Crude Odds Ratio
HADS	=	Hospital Anxiety and Depression Scale
OSS-3	=	Oslo-3 Social Support Scale
SPSS	=	Statistical Package for Social Sciences
W.H.O	=	World Health Organization

AUTHORS' CONTRIBUTIONS

TA has designed the study, contributed in analysis and draft of the manuscript, interpretation, and wrote up. WG has participated in data collection; write up, analysis, and interpretation. ZW contributed to data collection; write up, analysis, and interpretation. All authors have read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the ethical review board of Mekelle University, College of Health Science, Ethiopia.

HUMAN AND ANIMAL RIGHTS

Not applicable.

CONSENT FOR PUBLICATION

Written consent taken from the participants for their voluntary participation after a complete description of the study was provided to them. The participant's profile was omitted for confidentiality.

AVAILABILITY OF DATA AND MATERIALS

The authors confirm that the data supporting the findings of this study are available within the article.

FUNDING

Mekelle University has financially supported the process of data collection. The funder has no role in the design and outcome of the study.

CONFLICT OF INTEREST

The authors declare no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

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