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Prevalence and Associated Risk Factors of Depression Among Cancer Patients at the National Oncology Center, Sana'a City

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"Using reason to support a point of view, so that known or unknown audiences maybe persuaded to agree."

Cottrell, S (2011), Critical thinking skills: developing effective analysis and arguments. 2nd ed. n. Basingstoke: Palgrave Macmillan, p52.

Dedication:

We dedicated this study to the almighty *God*, thanking *Him* for the guidance, strength, power of mind, protection and skills and for giving us a healthy life, all of this we offer in *His* name.

This study is wholeheartedly dedicated to our beloved parents, our brothers, and our sisters, who have been our source of inspiration and gave us strength when we thought of giving up; who continually provide their moral, spiritual, and financial support.

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Abstract

Background: Depression is a prevalent mental health issue that affects millions of individuals worldwide. When combined with the physical and emotional challenges of cancer, depression can significantly impact the well-being and treatment outcomes of cancer patients. Depression in this population is not only a result of the psychological distress associated with the disease but also the physiological changes caused by cancer and its treatments. In Yemen, the local data on the prevalence of depression among cancer patients and its risk factors remains poor.

Aim: The purpose of this study is to determine the prevalence and associated risk factors of depression among cancer patients in National Oncology Center, in Sana'a city.

Methodology: This cross-sectional study involved 350 participants and was carried out at the National Oncology Center in Sana'a city. Eligible participants who provided consent were interviewed; depression was assessed using the Patient Health Questionnaire 9 (PHQ-9). SPSS version 25 was used for data analysis. Data collection commenced after obtaining approval from the faculty of Medicine and Health Sciences at Emirates International University, as well as permissions from the National Oncology Center and individual participants.

Result: Out of 350 cancer patients, 224 (64%) were females and 126 (36%) were males, half of the patients (50%) were illiterates, with the mean age of 45.83 ± 14.68 years, 78.6 % were married, 60.3% live in rural areas and 39.7% live in urban areas, and 288 (82.3%) of the participants were outpatient. Breast cancer was the commonest cancer (26.3%) with 169 (48.3%) participants have taken chemotherapy. The overall prevalence of depression among study population was 47.1%. The prevalence of depression was 49.1% among those who were above 45 years old, 34.5% among participants between 31 and 45 years old, and 16.4% among those less than 30 years old. The association between gender and the prevalence of depression was statistically significant. There was a significant association between education, occupation level, and the prevalence of depression. The prevalence of depression increased among outpatient participants (50.7%) compared with inpatient participants (30.6%) with

statistically significant association between cancer treatment setting and the prevalence of depression. The prevalence of depression was significantly high among participants who received chemotherapy (43%), with the response to treatment showed a significant association, as well; as the prevalence of depression was high among those who had regression response (60.0%). There was a significant association between side effects of treatment and the prevalence of depression, with prevalence being high among those who had treatment side effect.

Conclusion: The prevalence of depression is high among cancer patients, often going unnoticed or overlooked. It is imperative to routinely screen for depression in cancer patients before, during, and after receiving any form of therapy. Patients identified with depression should be promptly referred to a psychiatrist for thorough investigation of possible risk factors and early intervention to prevent disruption to timely management. This study represents a crucial initial step in shedding light on factors impacting mental health, which can hinder current treatment regimens. By aiding in the implementation and enhancement of outcomes in cancer management, including mental well-being, therapy compliance, and overall treatment protocols, it contributes significantly to improving cancer care.

Keywords: Cancer, Depression, Risk factor

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TABLE OF ABBREVIATIONS

Abbreviation	Meaning
AOR	Adjusted Odds Ratio
ASR	Age Standardized Rate
BCS	Breast Conserving Therapy
BR	Breast Reconstruction
CI	Confident Interval
DCR	Diagnostic Criteria for Research
DSM-V	Diagnostic and Statistical Manual of Mental Disorders Fifth Edition
ECT	Electroconvulsive Therapy
GCC	Gulf Cooperation Council
HADs	Hospital Anxiety and Depression Scale
HRQOL	Health-related Quality of Life
IARC	International Agency for Research on Cancer
ICD-10	International Statistical Classification of Diseases and Related Health Problems Tenth Edition
MDD	Major depressive disorder
MENA	Middle East and North Africa

MINAR	Multan Institute of Nuclear Medicine and Radiology Hospital
NMCH	Nalanda Medical College
NNT	Number Need to Treatment
PHQ-9	Patient Health Questionnaire-9
QOL	Quality Of Life
SSRI	Selective Serotonin Reuptake Inhibitor
TM	Total Mastectomy
UK	United Kingdom
US	United States
WHO	World Health Organization

CHAPTER 1
INTRODUCTION

1.1 Background

In 2018, around 18.1 million individuals worldwide were diagnosed with cancer, 9.6 million of them dying from it (Tabassum *et al.*, 2022).

Cancer patients typically experience psychological difficulties such as adjustment disorder, depressed mood, anxiety, and low life satisfaction, with depression being the most prevalent (Rastogi *et al*., 2019).

Depression, known as major depressive disorder (MDD) or clinical depression is a common and serious mood disorder. Those who suffer from depression experience persistent feelings of sadness and hopelessness and lose interest in activities they once enjoyed. Aside from the emotional problems caused by depression, individuals can also present with a physical symptom such as chronic pain or digestive issues. To be diagnosed with depression, symptoms must be present for at least two weeks (Jessica Truschel, 2018).

ICD-10	DSM-5
Depressive episode	**Major depressive episode**
Mild	Mild
Moderate	Moderate
Severe	Severe
Severe with psychosis	with psychotic features
Other depressive episodes	
Atypical depression	
Recurrent depressive disorder	**Major depressive disorder**
Currently mild	Recurrent
Currently moderate	
Currently severe	
Currently severe with psychosis	
In remission	
Persistent mood disorders	**Persistent depressive disorder**
Dysthymia	
Other mood disorders	**Other specified depressive disorder**
Recurrent brief	Recurrent brief depression
Depression	

Figure 1.1: ***Depression cretria; DSM-V and ICD-10*** *: Data from The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines, Copyright (1992), World Health Organization; Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Copyright (2013), American Psychiatric Association.*

The DSM-V outlines the following criterion to make a diagnosis of depression. The individual must be experiencing five or more symptoms during the same 2-week period and at least one of the symptoms should be either depressed mood or loss of interest or pleasure (Figure 1).

A recent study by the WHO, estimated that prevalence of depression globally is 3.8% (World health organization, 2023). Other recent studies found that the depressive disorders-related prevalence, incidence, and rates in MENA increased by 0.004%, 0.006%, and 0.005% from 1990 to 2019. This may be due to that North Africa/Middle East includes conflict countries such as Afghanistan, Iraq, and Lebanon, and Yemen (Baxter *et al.*, 2014). This showed the importance of future mental health research in conflict countries. Based on the evidence, the prevalence of depression and anxiety

disorders was highest in conflict countries with a history of war, many of which are in North Africa and the Middle East (Whiteford *et al.*, 2015).

The prevalence of depression in the Middle East varies across different countries and populations, influenced by cultural, social, and economic factors. Several studies have investigated this issue, shedding light on the mental health landscape in the region.

For instance, a study conducted by Al-Gelban (2009) in Saudi Arabia found that the prevalence of depression among primary care patients was around 31.6%. Similarly, a meta-analysis by Ghuloum *et al*. (2015) reported a pooled prevalence of depression among adults in the (GCC) countries to be approximately 22.9%.

In Lebanon, a study by Karam *et al.* (2008) revealed a prevalence of (MDD) of 10.9%, with higher rates among women compared to men. Additionally, a study conducted in Iran by Noorbala *et al*. (2004) estimated the prevalence of depressive disorders to be around 21.4%.

It is essential to note that these figures may not represent the entire Middle East region, and prevalence rates can vary within and between countries due to differences in methodologies, populations studied, and other contextual factors. Nonetheless, these studies highlight the significant burden of depression in the Middle East, underscore the importance of further research, and targeted interventions to address mental health needs in the region.

The causes of depression among cancer patients are complex and may include biological, psychological, and social factors. Some cancers, such as pancreatic and lung, can release chemicals that are thought to cause depression (National Cancer Institute, 2019). Some cancer treatments, such as chemotherapy, steroids, and hormone therapy, can also have direct or indirect effects on the brain and mood (Pitman *et al.*, 2018). In addition, cancer patients may face many challenges and losses that can trigger or worsen depression, such as pain, fatigue, changes in body image, fear of death, isolation, financial difficulties, and role changes (Niedzwiedz *et al.*, 2019).

The prevalence of depression in cancer patients varies depending on the type and stage of cancer, the method of assessment, and the criteria used for diagnosis. However, some studies have estimated that up to 20% of cancer patients experience depression at

some point during their illness. Depression can occur at any time during the cancer journey, from diagnosis to treatment to survivorship or end-of-life care (Pitman *et al.*, 2018).

1.2 Statement of Problem

Depression is a significant concern among cancer patients, as it can have detrimental effects on their overall well-being and treatment outcomes. The emotional and psychological burden of cancer often leads to the development or exacerbation of depressive symptoms in patients. It can lead to decreased adherence to treatment regimens, compromised immune function, increased pain perception, and reduced quality of life. Additionally, depression can also affect the patient's ability to cope with the emotional and physical challenges of cancer, further exacerbating their distress (Smith, 2015).

However, there is a lack of comprehensive understanding and effective interventions specifically tailored to address depression among cancer patients. This knowledge gap hinders the provision of optimal support and care for individuals facing both cancer and depression. Therefore, there is a pressing need to investigate and address the unique challenges associated with depression among cancer patients to improve their quality of life and treatment outcomes (Dauchy, Dolbeault and Reich, 2013).

To address the problem of depression among cancer patients, it is crucial to develop a comprehensive understanding of the unique challenges they face. This includes studying the prevalence of depression, the risk factors, underlying mechanisms, and the impact of depression on treatment outcomes (Smith, 2015).

1.3 Significance of Study

In Yemen, the local data on the prevalence of depression among cancer patients and its risk factors remains poor. Therefore, the main purpose of this research is to determine the prevalence of depression among the cancer patients who attend National Oncology Center. The other purpose of this research is to determine the risk factors associated with depression and the result can help to improve the preventive measures of depression in cancer patients. The results of this research can also serve as a basis for future research studies and increase the awareness of the importance of depression screening among cancer patients to improve their quality of life and to contribute to better treatment outcomes and reduced healthcare costs.

1.4 Objectives

1.4.1 General objective:

This research aims to determine the prevalence and associated risk factors of depression among cancer patients in National Oncology Center, in Sana'a city.

1.4.2 Specific objectives:

1. To determine the prevalence of depression among cancer patients
2. To describe the socio demography (age, gender, education level, marital status, occupation and residency) clinical profiles (type of cancer, duration since diagnosis, stage of cancer, type of treatment, response to treatment, treatment side effect, comorbidity, treatment setting) and patient's lifestyle (smoking, physical activity, chewing khat, and shamma taking).
3. To determine the association between the socio demography of the patients (age, gender, education level, marital status, occupation, residency) and the prevalence of depression.
4. To determine the association between the clinical profiles of the cancer patients (type of cancer, duration since diagnosis, stage of cancer, type of treatment, response to treatment, treatment side effect, comorbidity, treatment setting) and the prevalence of depression.
5. To determine the association between patient's lifestyle (smoking, physical activity, chewing khat, and shamma taking) and the prevalence of depression.

CHAPTER 2
LITERATURE REVIEW

2.1 Clinical Overview:

Depressive disorders are one of the most common mental health diseases globally, affecting about 121 million people and responsible for 5% of disability-adjusted life years across the world (Vos *et al.*, 2017). According to (WHO), major depressive disorder (MDD) will become the leading cause of disability in 2030 (Yang *et al.*, 2015). Depressive disorders are associated with adverse life events e.g. suicide, inverse health outcomes, disruptions of family relationships, reduced work performance, sedentary, increased risk of self-injury, drug abuse, and reduced life expectancy (Moussavi *et al.*, 2007). The most widely used criteria for diagnosing depressive conditions are found in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM) and the World Health Organization's International Statistical Classification of Diseases and Related Health Problems (ICD). The latter system is typically used in European countries, while the former is used in the US and many other non-European nations (Parker, 2014)

According to DSM-V, at least one of the symptoms is either depressed mood or loss of interest or pleasure. Depressed mood occurs nearly every day as subjective feelings like sadness, emptiness, and hopelessness or observations made by others (e.g. appears tearful). Loss of interest or pleasure occurs in all or almost all activities of the day, nearly every day. These symptoms, as well as five out of the nine more specific symptoms listed, must frequently occur two weeks (to the extent in which it impairs functioning) for the diagnosis (American Psychiatry Association, 2013). The central features of these syndromes are:

- Depressed Mood
- Negative Thinking
- Lack Of Enjoyment
- Reduced Energy
- Slowness.

A major depressive episode is characterized by the presence of a severely depressed mood that persists for at least two weeks (American Psychiatric Association, 2000). Episodes may be isolated or recurrent and are categorized as mild (few symptoms in excess of minimum criteria), moderate, or severe (marked impact on social or occupational functioning). An episode with psychotic features—commonly

referred to as psychotic depression—is automatically rated as severe. If the person has had an episode of mania or markedly elevated mood, a diagnosis of bipolar disorder is made instead. Depression without mania is sometimes referred to as unipolar because the mood remains at one emotional state or "pole" (Parker 1996).

Bereavement is not an exclusion criterion in the DSM-V, and it is up to the clinician to distinguish between normal reactions to a loss and Major Depressive Disorder. There are the range of related diagnoses which considered excluded from the criteria, including dysthymia, which involves a chronic but milder mood disturbance; recurrent brief depression, consisting of briefer depressive episodes; minor depressive disorder, whereby only some symptoms of major depression are present; and adjustment disorder with depressed mood, which denotes low mood resulting from a psychological response to an identifiable event or stressor (American Psychiatric Association 2013).

People are most likely to develop their first depressive episode between the ages of 30 and 40, and there is a second, smaller peak of incidence between ages 50 and 60. (Eaton *et al.*, 1997). The risk of major depression is increased with neurological conditions such as stroke, Parkinson's disease, or multiple sclerosis, and during the first year after childbirth. (Rickards, 2005). It is also more common after cardiovascular illnesses, and is related more to those with a poor cardiac disease outcome than to a better one (Alboni *et al.*, 2008). Depressive disorders are more common in urban populations than in rural ones and the prevalence is increased in groups with poorer socioeconomic factors, e.g., homelessness.

2.2 Depressive Episode:

The life-time risk of depression in males is 8-12% and in females is 20-26%. However, the life-time risk of major depression (or depressive episode) is about 8%. The typical depressive episode is characterized by the following features :(which should last for at least two weeks for a diagnosis to be made) (Niraj Ahuja, 2011)

2.2.1 Depressed Mood:

The most important feature is the sadness of mood or loss of interest and/or pleasure in almost all activities (pervasive sadness), present throughout the day (persistent sadness). This sadness of mood is quantitatively as well as qualitatively different from the sadness encountered in 'normal' sadness or grief. The depressed mood varies little from day to day and is often not responsive to the environmental stimuli. The loss of interest in daily activities results in social withdrawal, decreased ability to function in occupational and interpersonal areas and decreased involvement in previously pleasurable activities. In severe depression, there may be complete anhedonia (Inability to experience pleasure). Mood disorders are characteristically recurrent, and Kraepelin was guided by the course of illness when he brought mania and depression together as a single entity. He found that the course was essentially the same whether the original disorder was manic or depressive, and so he put the two together in a single category of manic–depressive psychosis (Niraj Ahuja, 2011).

2.2.1 Depressive Ideation/Cognition:

Sadness of mood is usually associated with pessimism, which can result in three common types of depressive ideas. These are hopelessness (there is no hope in the future), helplessness (no help is possible now), and worthlessness (feeling of inadequacy and inferiority). The ideas of worthlessness can lead to self-reproach and guilt-feelings. The other features are difficulty in thinking, difficulty in concentration, indecisiveness, subjective poor memory, lack of initiative and energy. Often there are ruminations (repetitive, intrusive thoughts) with pessimistic ideas. Thoughts of death and preoccupation with death are common. Suicidal ideas may be present. In severe cases, delusions of nihilism (e.g. 'World is coming to an end', 'My brain is completely dead', 'My intestines have rotted away') may occur (Niraj Ahuja, 2011).

2.2.2 Physical-Symptoms:

Multiple physical symptoms (such as heaviness of head, vague body aches) are particularly common in the elderly depressives and depressed patients from the developing countries (such as India). However, the recent literature has shown that multiple physical symptoms (called general aches and pains) are present in most patients even in the Western world and they can be elicited only if physicians routinely ask the patients for their presence. Hypochondriacal features may be present in up to a quarter of depressives presenting for treatment. These physical symptoms are usually present in severe depressive episode. Another common symptom is the complaints of reduced energy and easy fatigability. The patients, therefore, not surprisingly attribute their symptoms to physical cause(s) and consult a physician instead of a psychiatrist. (Niraj Ahuja, 2011).

2.2.3 Biological Functions:

Disturbance of biological functions is common, with insomnia (or sometimes increased sleep), loss of appetite and weight (or sometimes hyperphagia and weight gain), and loss of sexual drive. When the disturbance is severe, it is called as melancholia (somatic syndrome in ICD-10-DCR). The presence of somatic syndrome in depressive disorder signifies high severity and more biological nature of the disturbance. It often also implies a good response to somatic methods of treatment (e.g. pharmacotherapy, ECT) (Niraj Ahuja, 2011).

2.2.4 Absence of Underlying Organic Cause:

If depressive episode is secondary to an organic cause, a diagnosis of organic mood disorder should be made. In ICD-10, the severity of depressive episode is defined as mild, moderate or severe, depending primarily on the number of the symptoms, but also on the severity of symptoms and the degree of impairment (Niraj Ahuja, 2011).

2.3 The treatment of acute depression:

2.3.1 Antidepressant drugs:

Antidepressant drugs are effective in the acute treatment of major depression. The largest effects relative to placebo are seen in patients with major depression whose symptoms are at least of moderate severity. Short-term response rates in controlled trials are about 50% for patients on active treatment, and about 30% for those on placebo; the need number to treatment (NNT) is between 5 and 7 (Cleare *et al.*, 2015). In terms of efficacy there is little to choose between the various antidepressants, although some are better than others in certain defined situations. Similar clinical response rates are seen in dysthymia, where again several classes of antidepressant drugs, including tricyclic antidepressants and SSRIs, have shown therapeutic efficacy. A meta-analysis showed a response rate in patients receiving active treatment of 52%, compared with 29% in those on placebo (NNT = 5) (Levkovitz *et al.,* 2011). Antidepressants do not appear to be more effective than placebo in the treatment of minor depression (Barbui and Cipriani, 2011).

2.3.2 Lithium as a sole treatment:

This section is concerned only with lithium as a treatment for depressive disorders. Placebo-controlled trials suggest that lithium may have some antidepressant efficacy in bipolar depression, but its effects in unipolar depression as a sole treatment are not established (Goodwin *et al.*, 2016).

2.3.3 Lithium in combination with antidepressants:

Despite its limited utility as a sole drug treatment for depression, lithium can produce useful therapeutic effects when added to antidepressant medication in treatment-resistant patients (lithium augmentation). In a meta-analysis, about 40% of depressed patients responded to lithium augmentation of their antidepressant regimen, compared with about 15% of patients who were given placebo (Nelson *et al.,* 2014). Although some studies have reported, a rapid amelioration of the depressed state within as little as 48 hours after the addition of lithium, the more usual pattern of response is a gradual resolution of symptoms over 2–3 weeks. The effects of lithium augmentation in depression do not appear

to be restricted to any specific class of antidepressants. (Harrison *et al.*, 2018).

2.3.4 Anticonvulsants:

Anticonvulsants such as carbamazepine, valproate, and lamotrigine are useful in the management of bipolar disorder, and preventing episodes of major depression. While the role of these agents in acute antidepressant efficacy in unipolar depression is unclear. Lamotrigine has been shown to have antidepressant effects in placebo-controlled trials in bipolar depressed patients, particularly those with higher levels of symptomatology, but whether this therapeutic property extends to unipolar depression is currently uncertain (Barbee *et al.*, 2011).

2.3.5 Indications for Electroconvulsive therapy (ECT):

Clinicians generally agree that the therapeutic effects of ECT are greatest in severe depressive disorders, especially those in which there is marked weight loss, early morning waking, retardation, and delusions. From the trials comparing full ECT with simulated ECT, it appears that delusions and (to a lesser extent) retardation are the features that distinguish patients who respond to full ECT from those who respond to placebo (UK ECT Review Group, 2003). Other studies have established that patients with depressive psychosis respond better to ECT than to tricyclic antidepressants or antipsychotic drugs given alone. However, combined treatment with antidepressants and antipsychotic drugs may be about as effective as ECT, although no direct comparisons have been made. Another point of practical importance is that ECT may often prove effective in depressed patients who have not responded to full trials of medication, whether or not psychotic features are present. However, in such patients relapse rates are high (Heijnen *et al.*, 2010).

2.4 Prevalence of cancer in Yemen:

- Approximately 35,000 Yemenis currently have cancer, 16,200 of whom are women and 4,300 are children, and more than 11,000 are newly diagnosed with the disease every year, according to the World Health Organization (WHO Feb 4, 2022).
- Total cancer cases at 2018 was 13,182 cases (Cancer County profile).

- Total cancer cases at 2020 number of prevalent cases (5-year) was 26651, while number of new cases 16476 case (WHO - Globocan).
- Total cancer cases at 2022 Age-Standardized Rate (ASR) of cancer in Yemen (2020) of 97/100,000 population, with 92.7/100,000 in males and 102.2 in females (IARC. In: Cancer today: estimated age-standardized incidence rates (world) in 2020, all cancers, all ages; Yemen).

2.5 Prevalence of depression among cancer patients

Cancer, as a disease, constantly compromises and inhibits a patient's vitality (Mikkelsen *et al.*, 2009). Not astonishingly, many of these patients reported psychological manners mainly depression that associated strongly with reduced quality of life and effect of daily act (Riedl and Schuessler, 2022).

The prevalence rate for depression among patients with cancer outstripped that in patients with other medical cases or involving surgical illnesses, and mainly logistical with poor prognostic cases (Sotelo, Musselman and Nemeroff, 2014).

As reported in previous studies among patients with cancer, as in India their estimated prevalence of depression was extreme reaching up to 64% (Rastogi *et al.*, 2019). Whereas, in Jordan, recent study estimated that prevalence rate for depression generally accounts for 23.4 % (Naser *et al.*, 2021). Moreover, depressive symptomatology was far-flung among those in the inpatient settings compared to outpatient settings (Naser *et al.*, 2021).

A systemic review showed that the prevalence rate of depression widely between questionnaire based and interview-based variations. In addition, the reported prevalence in general is 24.6% (Riedl and Schuessler, 2022).

2.6 Pathogenesis of depression in cancer patients

Cancer is the most stressful event that triggers depression. The cause of that can be psychosocial, biological and even iatrogenic (Smith, 2015).

Psychosocial: Depression may result from stress that overwhelms a person's ability to adjust to changes in life, leading to a persistently low mood, despair,

anhedonia and feelings of hopelessness. Emotional stress may stem from a bleak prognosis or the extreme uncertainty that patients endure. This is compounded by the negative effects that a cancer diagnosis and treatment may have on a patient's job, family, physical appearance, abilities, independence and finances. Those with maladaptive coping strategies, previous mental illness and poor communication with medical practitioners are at particularly high risk of developing depression (Smith, 2015).

Biological: Changes in neurotransmitter levels, such as serotonin, norepinephrine, and dopamine, have been implicated in both depression and cancer-related fatigue. The interaction between the central nervous system and the immune system may contribute to these changes (Dantzer, Meagher and Cleeland, 2012).

Chronic inflammation, which is often present in cancer, has been associated with an increased risk of depression. Inflammatory cytokines may affect neurotransmitter function and contribute to the development of depressive symptoms (Howren, Lamkin and Suls, 2009).

Iatrogenic: The physical side effects of cancer treatments, such as chemotherapy-induced fatigue or cognitive impairment, can contribute to the development of depression (Weis, 2011).

2.7 Associated factors of depression in cancer patients

Proposed risk factors for depression somehow deviate in different studies. The main factors implied were about the cancer types (most common differ in each country); furthermore, age, and even sex, in addition to previous education about their illness had an effect on their treatment. However, lifestyle merely explored in few studies as risk of depression in these patients (without any assessed investigations such as smoking for tobacco-related cancer) (Jia *et al.*, 2017).

By focusing light on the risk factors of depression in cancer patients that have been included in previous studies, we found that the risk factors were principally implying on (socio-demographic status and medical profiles characteristics).

2.7.1 Socio-demographic factors

2.7.1.1 Age

Approximately two-thirds of the patients were over 50 years old represented by (60.6%) in India (Rastogi *et al.*, 2019). Likely, in Bangladesh age range of 51-60 years old had more relevant prevalence rate that is (41.3%) (Tabassum *et al.*, 2022). Study was done in Nigeria in 2020, and result that age has a strong correlation with symptoms of depression, this signifies that as people age become older, they get easily depressed by cancer (Muo, & Immanuel, 2020).

On the contrary, another related study in Morocco concluded the factors that increased the risk of depression among cancer patients included being under 50 years of age (Safiya Mahlaq *et al.,* 2023).

2.7.1.2 Gender

Out of 203 participants (69.5%) were men and (30.5%) were women, which basically shows that males are highly affected with psychological symptoms (Rastogi *et al*., 2019). Zielińska-Wieczkowska and Betłakowski analyzed depression in cancer patients undergoing chemotherapy using Zung Self-rating Depression Scale and concluded that depression was more in women (Rastogi *et al*., 2019). Unlikely, in Nigeria a published article claimed that gender did not significantly predict depressive symptoms (Muo, & Immanuel, 2020).

2.7.1.3 Marital status

Jordanian study reported that married patients had an exaggerated rate than other status represented by (82.4%) through overall cases (Naser *et al.*, 2021).

A cross - sectional study in AlBairouni hospital in Damascus, Syria carried out using face-to-face interviews based on a structured questionnaire. Social status as divorced women showing the strongest connection with depression,

followed by widowed and married women compared to single women (Soqia *et al.*,2022).

Moreover, cross-sectional study was in the MINAR and NMCH, Multan including 200 cancer patients, conducted that there's a relationship between marital status and depression and was more in married couples (79.3%)(von Glischinski, von Brachel and Hirschfeld, 2018).

2.7.1.4 Occupation:

Not surprisingly, that most patients were unemployed as reported in India by (40.4%) and with unsecure job were even higher than dependent patients which represent (47.3%) (Rastogi *et al.,* 2019).

2.7.1.5 Educational level:

A cohort study included 2337 men diagnosed with prostate cancer showed that the hazard of depression was 1.86-fold higher in prostate cancer patients with short education compared to those with long education (Friberg *et al.*,2019).

A cross-sectional study was conducted in Northwest Ethiopia showed that the odd of depression among patients who attended college and above was significantly reduced when compared to those with no education (Baraki, Tessema, Demeke, 2020). However, another study conducted by The National Cancer Registry where most participating women (50.0%) were illiterate or with basic educational level; they were found to be with the highest prevalence of cancer, as well. For the impact of psychiatric morbidity due to the educational level, the prevalence of depression on said study happened to be more common in educated women (56.8%) as compared to illiterate women (43.2%) (Hassan *et al*., 2003).

2.7.1.6 Residency

The place of residence is one of the predictor factors of depression. The cancer

patients who live in rural area had 2.6 times more possibility to develop depression disorder than those who live in urban area (Tsaras *et al.,* 2018).

Additionally, in Bangladesh a cross-sectional study proved that patients from rural area were (52.6%), while patients from urban were (47.3%) (Tabassum *et al.,* 2022).

Cross-sectional study done by (Sadaqa *et al.,* 2022) in Palestine showed that asymptomatic-mild depression within residents who were living in west bank and Gaza was (64.2%) and (66.7%) respectively. Whereas, moderate-severe depression were (35.8%) and (33.3%) respectively. Additionally, Research suggests that rurality negatively impacts survival. A survival analysis in Australian cancer patients showed that cancer patients living in remote areas are 35% more likely to die within 5 years of a cancer diagnosis than those living in urban areas (Jong *et al.,* 2004). That fact can be, yet, another caveat for development of a much more aggressive forms of depression.

2.7.2 Clinical profiles factors

2.7.2.1 Cancer treatment setting

Outpatient setting shows higher prevalence than in inpatient setting by (5-16%) and (4-14%) respectively (Rastogi *et al.,* 2019).

2.7.2.2 Type of cancer

As reported in Indian study showed that, head and neck cancers were the most common in getting depression than other types by prevalence rate (63%) (Rastogi *et al.,* 2019). In contrast, breast cancer was higher in prevalence (20.7%) in Bangladesh (Tabassum *et al.*, 2021). Moreover, Egypt is considering bladder cancer as higher prevalence than other types, mainly post-treatment cancer (18.44) (Vartolomei *et al.*, 2018). On the contrary, a study led by E. L. Zeilinger published online that showed the prevalence of depression according to different cancer types depict the results of ordinal regression analysis. Cancer types with highest depressive symptoms were lung, kidney/urinary tract/bladder and brain cancer. The lowest rate of depressive symptoms was found in breast cancer, testis cancer and hematologic malignancies. Patients with breast cancer had

significantly fewer symptoms of depression than patients with lung cancer, kidney/urinary tract/bladder cancer, brain cancer, head and neck cancer and pancreatic cancer. All other cancer types did not differ significantly from each other in relation to depressive symptoms (Zeilinger *et al.*, 2022).

2.7.2.3 Cancer stage

In the current study, stage 2 cancer was found in 33.3% of cases, stage 3 in 28.0% of patients, stage 4 in 21.3% of patients, and stage 1 in 17.3% of cases. Maximum 43.7% of patients with stage 4 had severe depression symptoms, 42 patients with stage 3 had maximum 35.7% patients with serious depression symptoms, and maximum 84.0% of patients with stage 2 had mild to moderate depression symptoms. A significant correlation was seen between the stage of cancer and the degree of depression symptoms ($p<0.05$). In 32 patients with stage 4, the highest percentage (87.5%) reported moderate to severe anxiety symptoms; in 42 patients with stage 3, the highest percentage (45.2%). The current study revealed that 33.3% of patients had cancer stage 2, 28.0% had stage 3, 21.3% had stage 4, and 17.3% had stage 1. Of the thirty-two patients (Tabassum *et al.*, 2022). In another study in Department of Psychiatry, Faculty of Medicine, Fayoum University, Half of the participating women had stage III breast cancer. According to the pathological grading, they were distributed as 5 (7.8%) in stage I, 16 (25.0%) in stage II, 32 (50%) in stage III, and 11 (17.2%) in stage IV (Alagizy *et al.*, 2020).

2.7.2.4 Type of treatment

Surprisingly, in Indian study; depression was associated with a smaller number of chemotherapy cycles and represented by (60.6%) (Rastogi *et al.,* 2019). Similarly, recent Jordanian study estimated that chemotherapy sessions exceed other type of treatment represented by overall prevalence is (56%) (Jia *et al.*, 2017).

Regarding radiotherapy, some studies show no significant association between depression prevalence and treatment outcomes. Another study comparing levels of sadness, anxiety, and weariness in breast cancer patients before and after radiotherapy observed no difference in anxiety and sadness scores post-treatment,

despite an increase in fatigue and a loss of energy (Celik, Tuna, Samancioglu, and Korkmaz, 2016). However, over one-third of patients undergoing radiation therapy reported mildly or significantly improved symptoms of depression and anxiety, suggesting a positive impact on emotional well-being during treatment (Maurer, Schäfer, Maurer, and Kölbl, 2012).

Some studies that take the relationship between Depression prevalence in cancer patients undergoing radiotherapy sow no different or any association like in study showed that the comprehension scores of the disease, the treatment plan, the side effects, and patient satisfaction did not correlate with the HAD(A) or HAD(D) scores. Neither did any scores correlate with presumed predictive variables like diagnosis, gender, age, treatment goals, time from diagnosis, education, marital status, profession, life habits, or the role of the doctor in obtaining informed consent.(Dr Luigi, 2003).

Whereas, other study compared the levels of sadness, anxiety, and weariness in breast cancer patients before and after RT. There was no difference in the anxiety and sadness scores of breast cancer patients following radiation therapy, despite an increase in fatigue and a loss in energy.(Celik, Tuna, Samancioglu, and Korkmaz, 2016), and other showed over one-third of the patients receiving treatment experienced either mildly or significantly improved symptoms of depression and anxiety. This study demonstrated that feelings of despair and anxiety decreased while receiving radiation therapy (Maurer *et al.*, 2012).

In the context of surgical treatment, studies have yielded mixed findings regarding depression incidence. A study assessing breast cancer patients postoperatively found no statistically significant differences in depressive symptoms among those undergoing total mastectomy, breast-conserving therapy, or breast reconstruction (Zhang *et al.*, 2018). Conversely, another study comparing outcomes between patients undergoing surgery alone versus surgery combined with chemotherapy or radiation therapy showed reduced levels of anxiety, sadness, and signs of traumatic stress in those receiving only surgery (Graça Pereira, Figueiredo and Fincham, 2012). However, both surgical and non-surgical patients exhibited high rates of anxiety and depression in another study (Esteghamat *et al.*, 2014). Additionally, depression rates among women undergoing

conservative breast cancer surgery remained unaffected by whether or not breast reconstruction was performed. (Medeiros *et al.*, 2010).

In the other hand studies take the relationship between depression prevalence in cancer patients undergoing surgical treatment, as a study revealed that, at mean times more than a year postoperatively, there were no statistically significant differences in the incidence of depressive symptoms among breast cancer patients following total mastectomy (TM), breast conserving therapy (BCS), or breast reconstruction (BR). (Zhang *et al.*, 2018), and other study showed when compared to patients who had chemotherapy or radiation therapy in addition to surgery, the outcomes demonstrated that patients who received only surgery as treatment had reduced levels of anxiety, sadness, and signs of traumatic stress. (Graça Pereira, Figueiredo and Fincham, 2012).

Moreover, a study revealed both surgery and non-surgical patients had high rates of anxiety and depression (Esteghamat *et al.*, 2014). However, a study revealed whether or not breast reconstruction was done, women's depression rates were unaffected by conservative breast cancer surgery. (Medeiros *et al.*, 2010).

2.7.2.5 Response to treatment:

Depression in cancer patients may pose several difficulties in continuing the prescribed treatment within the scheduled time frame, which may ultimately affect the outcome, leading to increased morbidity and mortality. Determining the magnitude of depression and various factors associated with it, is of utmost importance to initiate the timely intervention, which may be either counseling, psychotherapy, antidepressant medication, or even alternative/complementary medicine such as yoga and meditation (Rastogi *et al*., 2019). Researches indicates that depression typically peaks during the phase and declines after treatment; however, this may vary based on the type of cancer and prognosis (Niedzwiedz *et al*., 2019). Depression peaked 25% before treatment and 23% during treatment, and then declined 13% after treatment. This within framework of women in UK having a lifetime prevalence of roughly 10% for clinical depression in comparison of depression were found in similar systematic review of depression in patient with prostate cancer 18%, during treatment 15%,and 17% prior to treatment. For men over 65, the prevalence of clinical depression is less than 9% (Niedzwiedz *et al.*, 2019).

A systematic review of 211 articles revealed that the prevalence of depression during treatment was 14%, 9% in the first year following diagnosis and 8% a year or

more after treatment (Niedzwiedz *et al.,* 2019).

2.7.2.6 Treatment side effect

Side effect of treatment with chemotherapy experienced that every participant in this study had some degree of chemo-related side effects including nausea, vomiting, loss of appetite and hair loss so patients quality of life and day-to-day activities are influencing with that effects (Sun *et al.,*2019) . Cachexia is associated with depression as recent study on 528 patient from cancer center was 285 patient (53.98%) were classified as cachexia and so the prevalence of depression 30.2% and severely depression was 6.7%, which were significantly higher than non-cachexia patient (Sun *et al.,*2019). On a study titled Cancer Treatment Effects on Cognition and Depression with 317 breast cancer survivors. Participants were 40-75 years old and had stage 0 (in situ) to IIIc breast cancer and were less than 10 years post treatment. The results from said study supported the importance of examining mediating factors in the effects of cancer treatment on cognition, particularly depression, following cancer treatment. Effects of treatment on cognition in breast cancer survivors are partially explained by changes in depressive symptoms, although chemotherapy may influence cognition independent of depression (Bedillion, Ansell and Thomas, 2019).

2.7.2.7 Cancer duration

In Spain, patients who are diagnosed for one year has higher prevalence for depression than more prolonged durations (Petrova *et al.*, 2021). Another study in the Bedford College in London showed quite similar pattern; as with a sample of 222 women with early breast cancer: 170 (77%) provided complete interview data up to either five years after diagnosis or recurrence. The results consecutively showed how Point prevalence of depression was 33% at diagnosis, falling to 15% after one year. 45%. Previous psychological treatment predicted depression, anxiety, or both in the period around diagnosis (one month before diagnosis to four months after diagnosis). Longer-term depression and anxiety were associated with previous psychological treatment, lack of an intimate confiding relationship, younger age, and severely stressful non-cancer life experiences (Burgess *et al.*, 2005).

2.7.2.8 Comorbidity

In recent study in Spain, obesity and hypertension were both representing the highest prevalence in accordance with depression with cancer patients (Petrova *et al.*, 2021). Whereas Netherlands study showed that hypertension has highest prevalence among colorectal cancer cases. Furthermore, heart disease was more relevant with colorectal cancer in addition to diabetes represented by (20%) and (15%) respectively (Vissers *et al.*, 2013).

2.7.3 Lifestyle

2.7.3.1 Physical Activity

Physical activity has been identified as a treatment that may provide symptom relief for depression (Singh *et al.*, 2023).

A systematic review and meta-analysis examined the effects of exercise on depressive symptoms in cancer survivors. The findings suggest that engaging in regular physical activity is associated with a reduction in symptoms of depression among cancer survivors. Additionally, the release of endorphins during physical activity is highlighted as a mechanism that can elevate mood and reduce feelings of pain and stress, contributing to the alleviation of depression symptoms experienced by cancer patients (Craft *et al.*, 2011).

The study done by Vienna General Hospital (Austria) (Matzka *et al.*, 2016), this study was cross-sectional observation study and include the cancer patients suffering from multiple symptoms related to their disease or treatment. That included fatigue, disturbed sleep, pain, nausea, lack of appetite and neuropath, these symptoms leading to distress, reduce health-related quality of life (HRQOL), and may limit treatment options, relationship between resilience and psychological dis-tress in cancer patients ,the results be when the high resilience scores show less anxiety and depression in samples of cancer survivors. Conversely, lower levels of resilience lead to impair in psychological functioning,

and fatigue among patients with cancer.

2.7.3.2 Smoking

Smoking is a behavior that increases the risk of depression. The higher the smoking frequency and smoking volume, the higher the risk of depression, whereas smoking cessation is associated with less risk of depression, and the longer the smoking cessation duration, the less the risk of depression (Wu *et al.*, 2023).

2.7.3.3 Khat chewing

The relationship between khat chewing and depression among cancer patients is not extensively studied.

Khat contains psychoactive compounds such as cathinone and cathine, which have stimulant effects. In some individuals, these stimulant effects may temporarily alleviate symptoms of depression by enhancing mood and energy levels (Al-Mugahed, 2008).

However, long-term khat chewing can lead to various adverse health effects, including cardiovascular problems, gastrointestinal issues, and psychological dependence. Chronic use of khat may exacerbate symptoms of depression due to its impact on neurotransmitter systems and overall health (Kalix, 1992).

Cancer patients undergoing treatment may be particularly vulnerable to the adverse effects of khat chewing. Chemotherapy, radiation therapy, and other cancer treatments can already cause physical and psychological side effects, and adding khat chewing to the mix may further worsen depression symptoms or interfere with treatment outcomes (Han, and Chen, 2020).

There is one cross sectional study done in southwest Ethiopia showed that the patients who used khat were 2 times more likely to develop depression than those who did not used khat (AOR = 2, 95 %CI: 1.17, 3.53) (Negesa, Gadisa, Kitaba, and Fufa, 2024).

2.8 Complication of depression in cancer patients

Depressed cancer patients are also at a higher risk of suicide compared with the public. Depression affects treatment participation, causes poorer outcomes and results in higher mortality. Depression causes a greatly diminished QOL (quality of life) in cancer patients by worsening physical symptoms, and increases the negative impact on patients and their families throughout the course of the disease. Depression in cancer patients increases the length of hospital stay and resource use, increasing health expenditure.

The presence of depression in cancer patients is associated with an increased risk of mortality. Depression may contribute to a faster progression of the disease and negatively impact survival rates (Satin *et al.*, 2009). Depressed cancer patients may experience social withdrawal and isolation, reducing their engagement with friends, family, and support networks. This isolation can further exacerbate feelings of loneliness and hopelessness (Hartung *et al.*, 2017).

2.9 Conceptual Frame

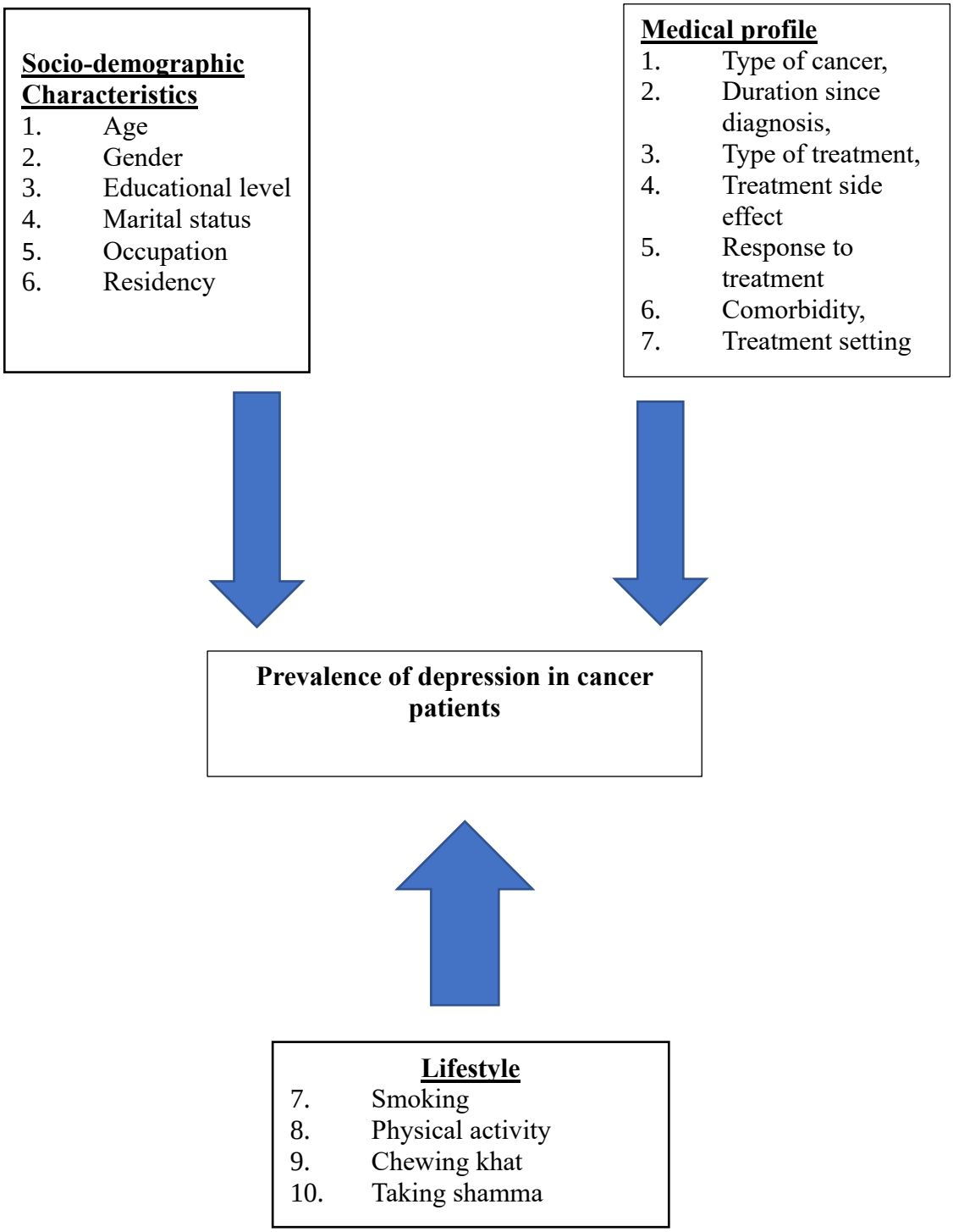

Figure 2.1: ***Conceptual framework of the prevalence and risk factors of depression among cancer patients in National Oncology Center, in Sana'a city***

CHAPTER 3
METHODOLOGY

3.1 Study Location:

The study was conducted in National Oncology Center, Sana'a City.

3.2 Study Design:

Hospital based cross-sectional study.

3.3 Sampling

3.3.1 Study population

The sample was cancer patients, who attended the National Oncology Center, from 7th of November to 13th of November 2023.

3.3.2 Inclusion criteria

The eligible patients were Yemeni patients their age 18 years or above, had a confirmed cancer diagnosis and had no apparent cognitive deficit.

3.3.3 Exclusion criteria

Patients who did not give consents were excluded from the study. Also, patients unable to participate in this study due to physical or emotional distress.

3.3.4 Sample Size

The sample size was estimated based on study done on India by Rastogi, *et al.* 2019. The prevalence of depression in cancer patients was 64%. Sample size was calculated by using this formula:

$$n = \frac{\{Z_{1-\alpha/2}^2 \dot{P} (1- \dot{P})}{d^2}$$ (Charan and Biswas, 2013)

n: is the sample size needed.

$Z_{1-\alpha}$ = Critical value and a standard value for the corresponding level of confidence. In this study it is 95% Cl is 1.96

P = Expected prevalence which based on previous research

d is the desired margin of error = 5% = 0.05

The sample size is 350

3.3.5 Sampling Technique

Systematic random sampling technique was used to select the study participants with a list of patients present at the center; which was prepared each day. Out of said list, every third entry was randomly selected for the study sample.

3.4 Data collection

Data was collected by structural standard questionnaire through face-to-face interview. The questionnaire was consisted of four sections, the first section was about the socio-demographic characteristics (age, gender, educational level, marital status, employment status and residency), the second section was about the medical history (diabetes duration, type of medication and), the third section was about the lifestyle (khat chewing, smoking, shamma use, physical activity), the last section about depression. To assess the depression the Arabic version of Patient Health Questionnaire (PHQ-9) was used (Kroenke, Spitzer, & Williams, 2001). The PHQ has nine items and is used to make diagnosis for depressive disorder. A cutoff point of 10 was used to classify patients as having depression or not (Manea, Gilbody, & McMillan, 2012).

Medical records were reviewed to ascertain the cancer stage of patients, given that a majority of them lacked awareness of their stage.

3.5 Validity and Reliability of Questionnaire

Face validity of questionnaire items was assessed by giving the questionnaire to experts and sample participants and ask them what they think the purpose of the questionnaire is and what construct they believe is being measured.

The validity and reliability of PHQ-9 has been established in study done in Saudi Arabia (AlHadi *et al.*, 2017). The study reported that PHQ-9 showed good internal consistency with Cronbach's alpha of 0.857 (AlHadi *et al.*, 2017).

The reliability of the questionnaire was assessed by measuring the Cronbach's alpha. The internal reliability of the PHQ-9 was excellent, with a Cronbach's α of 0.802.

3.6 Data Analysis

The data were analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were employed to characterize the prevalence of depression, providing insights into its frequency and distribution within the sample. Subsequently, chi-square tests were employed to assess the relationship between depression prevalence and associated factors.

3.7 Ethical Considerations

In addressing ethical considerations, appropriate measures were taken throughout the study. Firstly, clearance was obtained from the Faculty of Medicine and Health Sciences at Emirate University. Additionally, permission for the study was secured from the National Oncology Center. Prior to data collection, participants were provided with comprehensive verbal explanations about the study's purpose and procedures, and they were given the opportunity to ask questions before providing informed verbal consent. Moreover, participants were assured of the confidentiality and anonymity of their responses, emphasizing the importance of safeguarding their privacy throughout the research process.

CHAPTER 4
RESULTS

4.1 Patient's socio demography characteristics

The mean age of the study population was 45.83 ± 14.68 years (range 18- 83 years) (figure 4.1). There were 224 (64%) female and 126 (36%) male (figure 4.2). Half of the patients (50%) were illiterates (figure 4.3).

The married represented 78.6 % of the patients, 10.3 % were single, 9.4 % were divorced and 1.7% were widowed (figure 4.4). More than half of the patients (60.3 %) live in rural area and (39.7) live in urban area (figure 4.5). The occupational status of the study population is illustrated in (figure 4.6).

The charts below show the percentage of the sociodemographic characteristics of the study population.

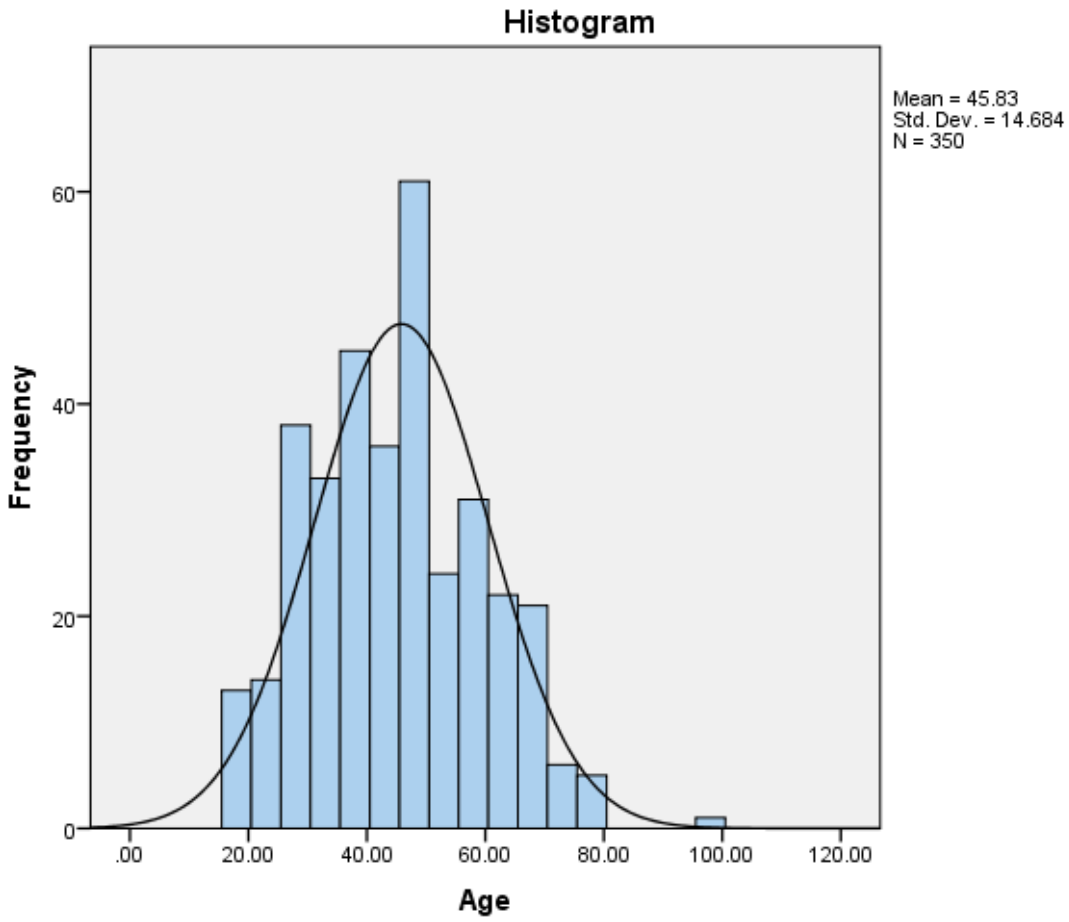

Figure 4.1: Age chart

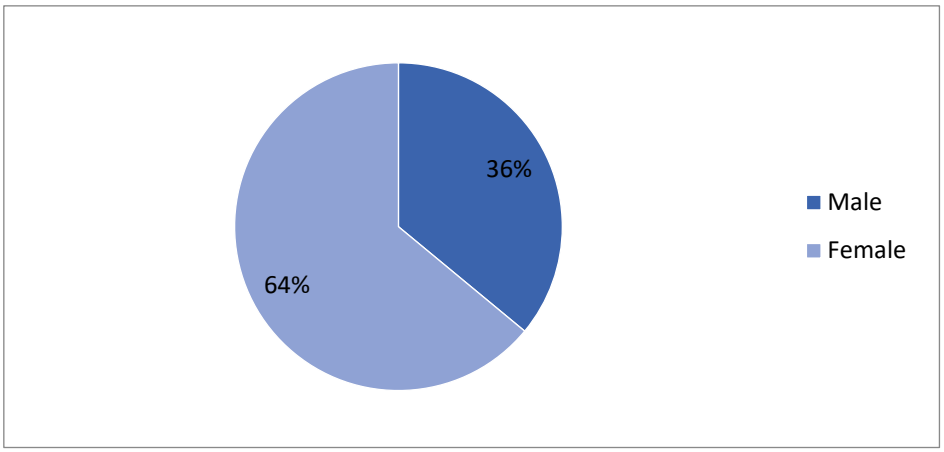

Figure 4.2: Gender chart

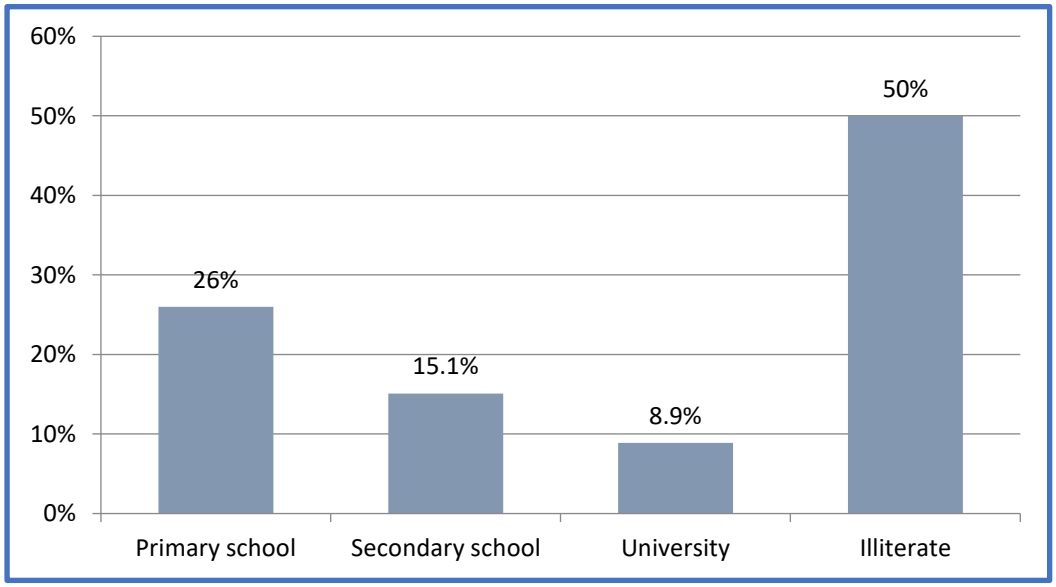

Figure 4.3: Education chart

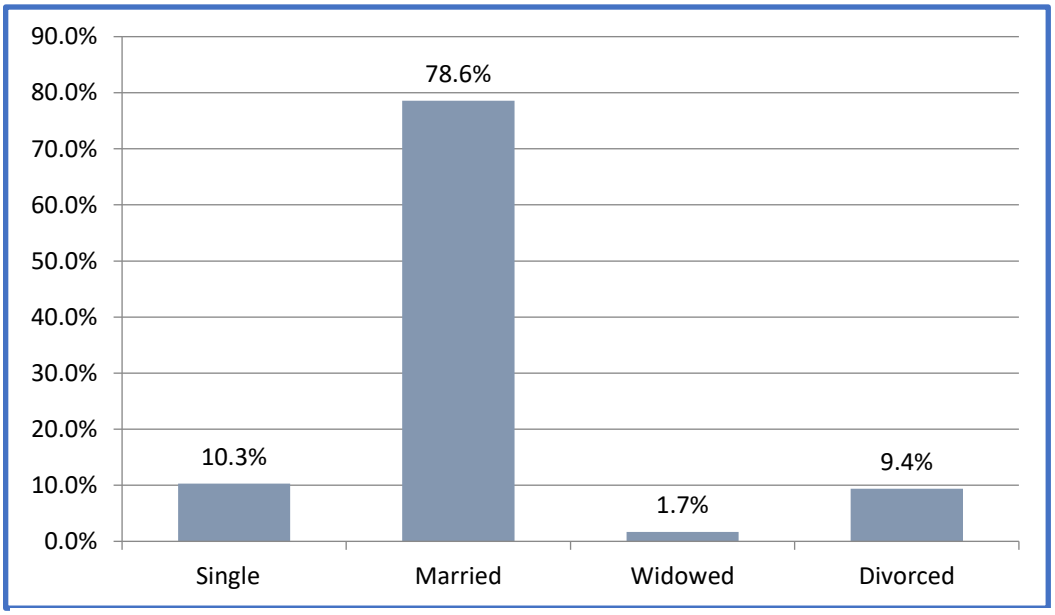

Figure 4.4: Marital status chart

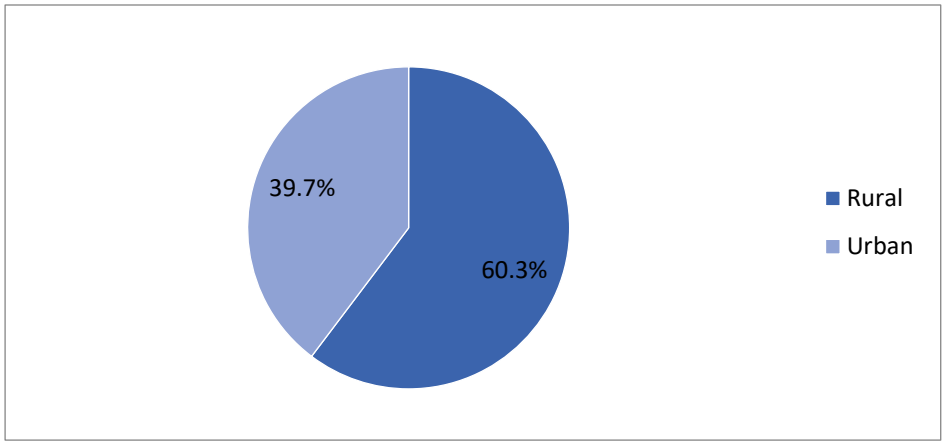

Figure 4.5: Residency chart

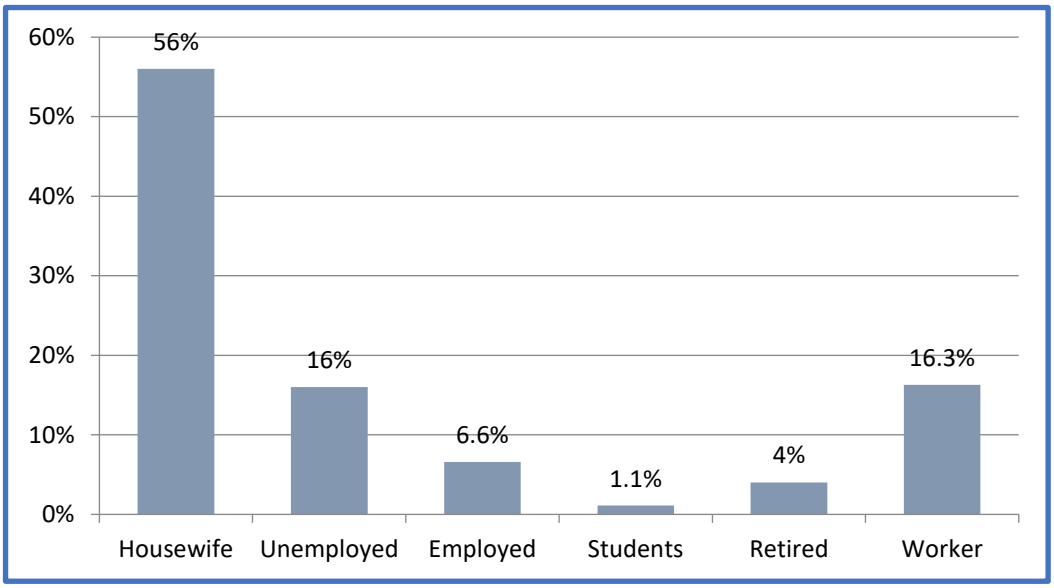

Figure 4.6: Occupation chart

4.2 Patient's clinical profiles characteristics

Two hundred eighty-eight (82.3%) of the participants were outpatient. Breast cancer was the commonest 92 (26.3%) cancer. Whereas head and neck cancer (14%), female genital organ cancer (10%), colorectal cancer (8.3%), stomach/ esophagus cancer (7.7%) and hematological cancer (7.1%) are ranked second to sixth. Most of the patients, 297 (84.9%), were diagnosed with the disease in the past two years prior to the study. Regarding the clinical stage of the disease, the third stage accounts for 133 (38%) patients. 100 (28.6%) of the patients in the second stage, 78 (22.3%) in the fourth stage, 16 (4.6%) in the first stage. A total of 169 (48.3%) participants have taken chemotherapy. Table 4.1 showed the type of treatment patients received for the cancer.

Table 04.1: Type of cancer treatment

Type of treatment (n=350)	Frequency	Percent
Chemotherapy	169	48.3%
Surgery	9	2.6%
Radiation	9	2.6%
Chemotherapy/Radiation	49	14%
Surgery/Chemotherapy	61	17.4%
Surgery/Radiation	14	4%
Surgery/Chemotherapy/Radiation	39	11.1%

Two-hundred eighty four (81.1 %) of the participants complain of treatment side effect. 66 % of the participants response well to the treatment. Eighty-six participants (24.5%) had additional co-morbidity. Forty-five had hypertension, eighteen had diabetes, eight had heart disease, five had COPD/Asthma, seven had kidney disease, and four participants had blood disease.

4.3 Patients' lifestyle

One hundred and six of the participants (30.3 %) are smoker and fifty-two (14.9%) are taking shamma. More than half of the participants are not physically active. 84% of the patients are chewing khat. The chart below shows these percentages.

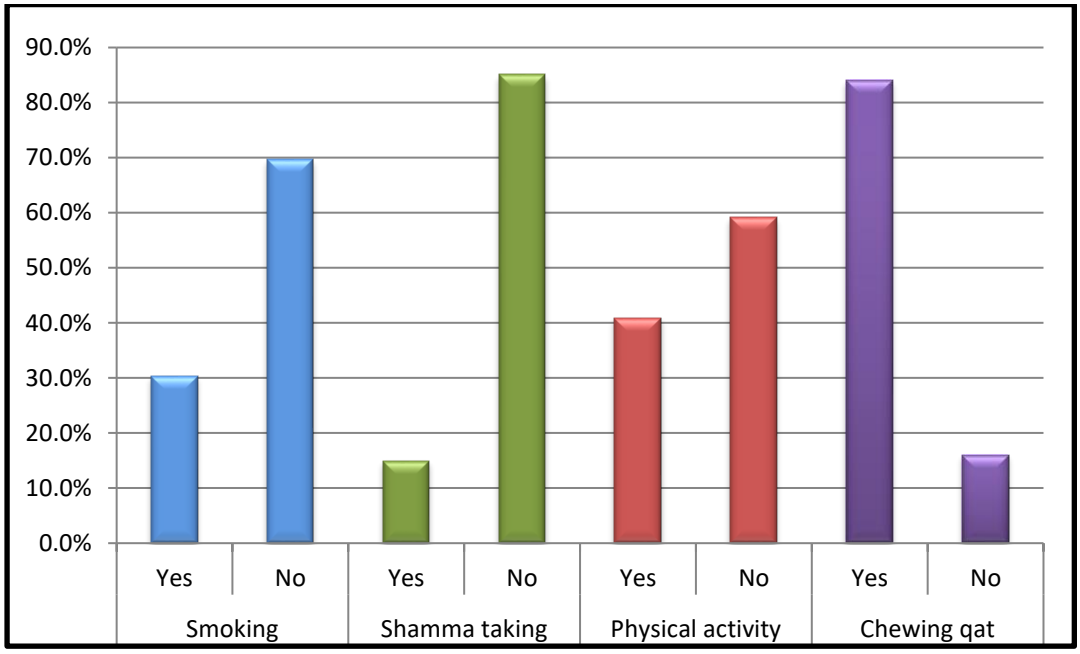

Figure 4.7: Patient's lifestyle

4.4 Prevalence of depression among cancer patients

In this study, the overall prevalence of depression was 47.1 %. From the total patients with depression (165), ninety-one patients (26%) had moderate depression, fifty-one patients (14.6%) had moderately severe depression and twenty-three patients (6.6%) had severe depression.

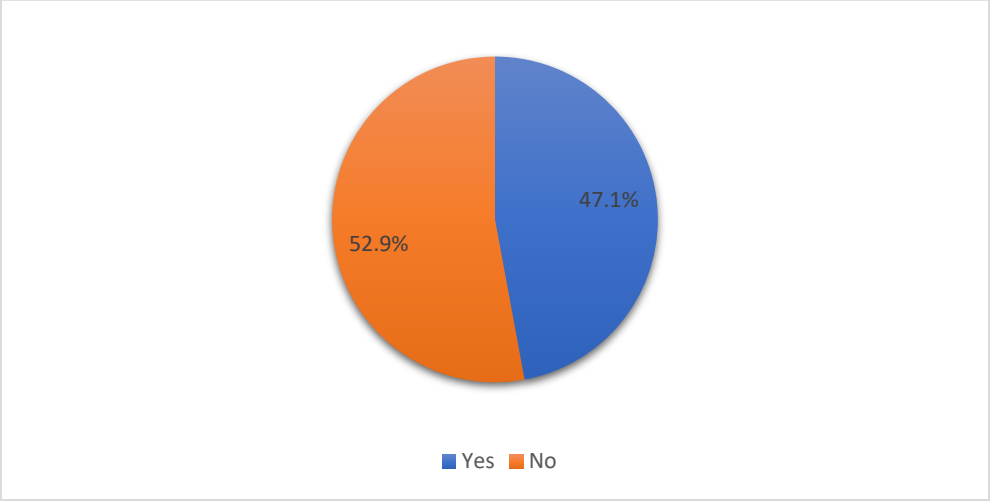

Figure 4.8: The prevalence of depression according to PHQ9 score

Figure 4.9 shows the prevalence of depression according to Patient Health Questionnaire score.

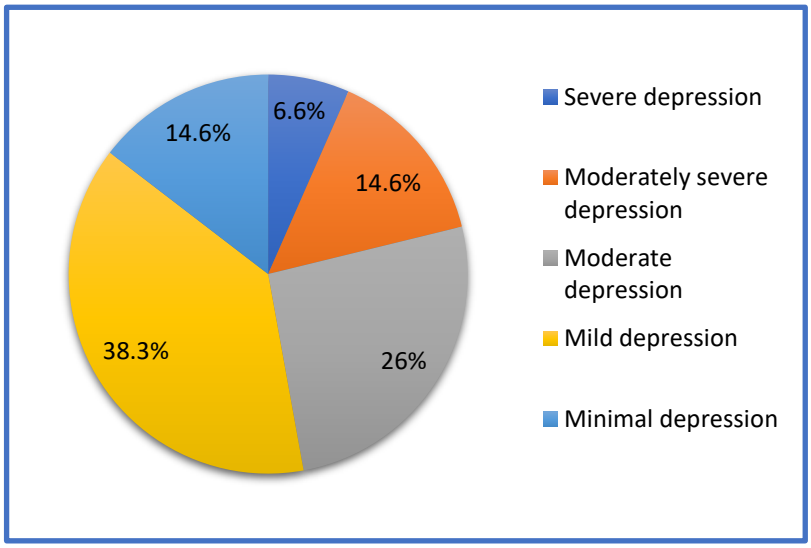

Figure 4.9: The prevalence of depression according to Patient Health Questionnaire score

Table 04.2: The prevalence of depression according to Patient Health Questionnaire score

Variables		The prevalence depression		Total
		No	Yes	
Age Mean±SD (45.83±14.68Y)	< = 30	20.5%	16.4%	18.6%
	31 – 45	30.8%	34.5%	32.6%
	> 45	48.6%	49.1%	48.9%
Sex	Male	45.9%	24.8%	36 %
	Female	54.1%	75.2%	64 %
Marital status	Single	11.9%	8.5%	10.3%
	Married	78.9%	78.2%	78.6%
	Widowed	7.6%	11.5%	9.4%
	Divorced	1.6%	1.8%	1.7%
Education	Primary school	25.9%	26.1%	26%
	Secondary school	18.9%	10.9%	15.1%
	University	11.9%	5.5%	8.9%
	Illiterate	43.2%	57.6%	50%
Cancer treatment setting	Inpatient	23.2%	11.5%	17.7%
	Outpatient	76.8%	88.5%	82.3%
Type of treatment	Radiation	1.6%	3.6%	2.6%
	Chemotherapy	53.0%	43.0%	48.3%
	Surgery	13.0%	15.2%	14.0%
	Chemotherapy/Radiation	4.3%	3.6%	4.0%
	Surgery/Radiation	20.5%	13.9%	17.4%
	Surgery/Chemotherapy	5.9%	17.0%	11.1%
	Surgery/Chemotherapy/Radiation	1.6%	3.6%	2.6%

The prevalence of depression was 49.1% among participants who were above 45 years old, 34.5% among participants who were between 31 and 45 years old and 16.4% among those who were less than 30 years old. The prevalence of depression among female was 75.2% and 24.8% among male. The depression increases among married participants 78.2% and housewives 67.9%. 61.2% of those who have depression were living in rural area and 57.6% were illiterate. The depression increases among the outpatient participants 88.5% and among those with breast cancer 30.3%. The participants who received chemotherapy were depressed 43% more than other participants.

4.5 Association between socio-demography and depression

Table 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 illustrate the association between patients' sociodemographic characteristics and the prevalence of depression.

4.5.1 Age

There was no significant association between age the prevalence of depression ($\mathcal{X}^2$ = 1.196, P = 0.550 > 0.05).

Table 04.3: The Relationship between Age and the Prevalence of Depression

Age	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
< = 30	65	27	16.4%	1.196	0.550
31 – 45	114	57	34.5%		
> 45	171	81	49.1%		

4.5.2 Gender

There was a significant association between gender and the prevalence of depression refers to females ($\mathcal{X}^2$ = 16.849, P = 0.0001 < 0.05). The table down shows the depression percentage among gender.

Table 04.4: Depression Percentage among Gender Characteristic

Gender	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
Male	126	41	24.8%	16.849	0.000
Female	224	124	75.2%		

4.5.3 Education level

There was a significant association between educational level and the prevalence of depression refers to illiterate patients ($\mathcal{X}^2$ = 11.359, P = 0.010 < 0.05). The illiterate patients have the highest percentage of depression. However, the lowest percentage was among patients who go to college.

The table down shows the depression percentage among educational level.

Table 04.5: Depression percentage among educational level.

Educational level	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
Primary	91	43	26.1%	11.359	0.010
Secondary	53	18	10.9%		
University	31	9	5.5%		
Illiterate	175	95	57.6%		

4.5.4 Marital status

There was no significant association between marital status and the prevalence of depression ($\mathcal{X}^2 = 2.451$, P = 0.484 > 0.05).

Table 04.6: The Relationship between Marital Status and the Prevalence of Depression

Marital status	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
Single	36	14	8.5%	2.451	0.484
Married	275	129	78.2%		
Widowed	6	3	11.5%		
Divorced	33	19	1.8%		

4.5.5 Occupation

There was a relationship between occupation and the prevalence of depression refers to housewives ($\mathcal{X}^2 = 19.264$, P = 0.002 < 0.05). The table down shows the depression percentage among occupation.

Table 04.7: Depression percentage among occupation

Occupation	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
Student	4	2	1.2%	19.264	0.002
Employed	23	8	4.8%		
Unemployed	56	20	12.1%		
Housewife	196	112	67.9%		
Retired	14	3	1.8%		
Worker	57	20	12.1%		

4.5.6 Residency

There was no relationship between residency and the prevalence of depression ($\mathcal{X}2 = 0.112$, P = 0.738 > 0.05).

Table 04.8: Depression percentage among residency

Residency	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
Rural	211	101	61.2%	0.112	0.738
Urban	139	64	38.8%		

4.6 Association between clinical profiles and depression

Table 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16 illustrate the association between patients' clinical profile characteristics and the prevalence of depression.

4.6.1 Cancer treatment setting

There was a significant association between cancer treatment setting and the prevalence of depression refers to outpatient ($\mathcal{X}^2 = 8.230$, P = 0.004 < 0.05). The prevalence of depression increased among outpatient participants 88.5% compared with inpatient participants 11.5%.

The table down shows the depression percentage among cancer treatment setting.

Table 04.9: Depression percentage among cancer treatment setting

Cancer treatment setting	Number of patients	Number of patients with depression	Percentage%	$\mathcal{X}^2$	P- value
In patients	62	19	11.5%	8.230	0.004
Out patients	288	146	88.5%		

4.6.2 Cancer type

There was a significant association between cancer type and the prevalence of depression ($\mathcal{X}^2$ = 28.550, P = 0.027 < 0.05). The participants with breast cancer (30.3%), female with head and neck cancer (13.9%), female genital organ cancer (13.3%), and stomach/esophagus cancer (7.3%) had the high prevalence of depression. The table down shows the depression percentage among cancer type.

Table 04.10: Depression percentage among cancer type

Cancer type	Number of patients	Number of patients with depression	Percentage %	$\mathcal{X}^2$	P- value
Breast	92	50	30.3%	28.550	0.027
Prostate	6	0	0.0%		
Colorectal	29	9	5.5%		
Lung	11	4	2.4%		
Female genital organ	35	22	13.3%		
Hematological	25	11	6.7%		
Stomach/Esophagus	27	12	7.3%		
Kidney/Urinary tract	9	2	1.2%		
Head and neck	49	23	13.9%		
Bladder	3	3	1.8%		
Pancreas	9	3	1.8%		
Brain	9	5	3.0%		
Hepatobiliary	4	1	6%		
Testes	4	0	0.0%		
Thyroid	8	3	1.8%		
Soft tissue	12	5	3.0%		
Others	18	12	7.3%		

4.6.3 Cancer stage

There was no significant association between stage of cancer and the prevalence of depression ($\chi^2 = 9.219$, P = 0.101 > 0.05).

Table 04.11: The Relationship between Cancer Stage and Prevalence of Depression

Cancer stage	Number of patients	Number of patients with depression	Percentage%	χ^2	P- value
One	16	5	3.0%	9.219	0.101
Two	100	48	29.1%		
Three	133	61	37.0%		
Four	78	44	26.7%		
Other	9	1	.6%		
Unknown	14	6	3.6%		

4.6.4 Type of cancer treatment

There was a significant association between type of treatment and the prevalence of depression refers to chemotherapy ($\chi^2 = 16.630$, P = 0.011 < 0.05). The prevalence of depression was high among participants who received chemotherapy (43%), surgery/radiation/chemotherapy (17%), and those who received radiation and chemotherapy (15.2%). The table down shows the depression percentage among other treatment types.

Table 04.12: Depression Percentage among Different Types of Cancer Treatment

Type of treatment	Number of patients	Number of patients with depression	percentage	χ^2	P-value
Surgical	9	6	3.6%	16.630	0.011
Chemotherapy	169	71	43%		
Radiation	9	6	3.6%		
Radiation/chemotherapy	49	25	15.2%		
Radiation/surgical	14	6	3.6%		
Chemotherapy/surgical	61	23	13.9%		
Surgical/chemotherapy/ radiation	39	28	17%		

4.6.5 Response to treatment

There was a significant association between response to treatment and the prevalence of depression refers to regression (χ^2 = 6.908, P = 0.032 < 0.05). The prevalence of depression was high among those who had regression response 60.0%. The table down shows the depression percentage among response to treatment.

Table 04.13: Depression percentage among response to treatment

Response to treatment	Number of patients	Number of patients with depression	Percentage%	χ^2	P- value
Progression	51	32	19.4%	6.908	0.032
Regression	231	99	60.0%		
Stationary	68	34	20.6%		

4.6.6 Treatment side effect

There was a significant association between side effect of treatment and the prevalence of depression refers to present side effect ($\mathcal{X}^2 = 6.225$, P = 0.013 < 0.05). The prevalence of depression was high among those who had treatment side effect 86.7%. The table down shows the depression percentage among treatment side effect.

Table 04.14: Depression Percentage among Treatment side effect.

Side effect	Number of patients	Number of patients with depression	Percentage%	$\mathcal{X}^2$	P- value
Present	284	143	86.7%	6.225	0.013
Absent	66	22	13.3%		

4.6.7 Cancer duration

There was no association between duration since diagnosis and the prevalence of depression ($\mathcal{X}^2 = 0.811$, P = 0.368 > 0.05).

Table 04.15: The Relationship between Cancer Duration and the Prevalence of Depression

Cancer duration	Number of patients	Number of patients with depression	Percentage%	$\mathcal{X}^2$	P- value
< = 2 years	297	137	83 %	0.811	0.368
> 2 years	53	28	17 %		

4.6.8 Comorbidity

There was no significant association between co-morbidity and the prevalence of depression (χ^2 = 11.921, P = 0.064 > 0.05)

Table 04.16: The Relationship between Comorbidity and Prevalence of Depression

Comorbidity	Number of patients	Number of patients with depression	Percentage %	χ^2	P- value
Hypertension	45	20	46.5%	11.921	0.064
Diabetes	18	7	16.3%		
Heart disease	4	3	7.0%		
COPD/Asthma	5	5	11.6%		
Obesity	3	1	2.3%		
kidney disease	7	3	7.0%		
Blood disease	4	4	9.3%		

4.7 Association between lifestyle and depression

Table 4.17, 4.18, 4.19, 4.20 illustrate the association between patients' lifestyle characteristics and the prevalence of depression.

4.7.1 Smoking

There was no significant association between smoking and the prevalence of depression (χ^2 = 0.479, P = 0.489 > 0.05).

Table 4.7.14.1: The Relationship between Smoking and Prevalence of Depression

Smoking	Number of patients	Number of patients with depression	Percentage%	χ^2	P- value
Yes	106	47	28.5 %	0.479	0.489
No	244	118	71.5%		

4.7.2 Physical activity

There was no significant association between physical activity and the prevalence of depression ($\chi^2 = 2.608$, P = 0.106 > 0.05).

Table 4.7.24.1: The Relationship between Physical Activity and Prevalence of Depression

Physical activity	Number of patients	Number of patients with depression	Percentage%	χ^2	P- value
Yes	143	60	36.4 %	2.608	0.106
No	207	105	63.6 %		

4.7.3 Chewing khat

There was no significant association between chewing khat and the prevalence of depression ($\chi^2 = 3.191$, P= 0.074 > 0.05). out of 295 patients who chew khat 133 patients had depression.

Table 4.7.34.1: The Relationship between Chewing Khat and Prevalence of Depression

Chewing qat	Number of patients	Number of patients with depression	Percentage%	χ^2	P- value
Yes	295	133	80.6 %	3.191	0.074
No	55	32	19.4 %		

4.7.4 Shamma taking

There was no significant association between shamma taking and the prevalence of depression ($\chi^2 = 3.813$, P= 0.051 > 0.05).

Table 4.7.44.1: The Relationship between Shamma Taking and Prevalence of Depression

Shamma taking	Number of patients	Number of patients with depression	Percentage%	χ^2	P- value
Yes	52	31	18.8 %	3.813	0.051
No	298	134	81.2 %		

CHAPTER 5
DISCUSSION

5.1 Patients' socio-demography, clinical profile and lifestyle characteristics

In this study, we determine the prevalence of depression among cancer patients and the associated factors. Three hundred and fifty patients involved in this study, 64 % of them were females, 78.6 % were married, 56 % were housewives, 60.3 % were living in rural area, the mean age of the participants was 45.83 ± 14.68 and 50% were illiterate. Most of the participants 82.3% were outpatient, breast cancer was the commonest type of cancer 26.3%, 38 % have reached to the third stage of tumor, half of the participants 48.3% received chemotherapy, and 24.5% had additional co-morbidity. 30.3 % of the patients were smoker, 84 % were chewing khat, 14.9% were shamma taker, and 40.9% were physically active.

The patients' characteristic in this study is quite similar to the patients' characteristic in one study had been done in Northwest Ethiopia (Baraki, Tessema, Demeke, 2020). The majority of the participants (64.2%) were females, (73.2%) were married, (42.4%) were housewives and 49.7% were illiterate. The mean age was 45.57 ± 13.77. Breast cancer was the commonest (26.2%) cancer, 29.8% have reached to the third stage and 43% participants have taken chemotherapy. 1.3% were smoker and 74.8% were physically active (Baraki, Tessema, Demeke, 2020).

5.2 Prevalence of depression among cancer patients

The depression among cancer patients in this study was determined by Patient Health Questionnaire-9 (PHQ-9), and its prevalence was compared with other study used the same questionnaire to assess the depression.

This study revealed a depression prevalence of 47.1%. This figure was lower than the rate observed in Northwest Ethiopia, which stood at 70.86% according to Baraki, Tessema, and Demeke's 2020 research. Conversely, it surpassed the prevalence documented in a study conducted at the Medical University of Vienna in Austria, where a rate of 15% was reported based on a robust sample of 7509 individuals, as outlined by Zeilinger, Oppenauer, Knefel, and Kantor in 2022. Notably, the prevalence in this study closely mirrored the depression prevalence recorded in Jordan at 51.9%, as reported by Mhaidat *et al.* in 2009. These comparative findings underscore the significant variation in depression rates across diverse geographical and demographic contexts.

5.3 Association between socio-demography and depression

5.3.1 Age

This study intriguingly found no significant association between age and depression ($p = 0.550$). This result contrasts with numerous other studies that have reported a clear link between age and depression. For instance, a comprehensive systematic literature review encompassing 40 studies by Riedl and Schuessler in 2022 demonstrated a consistent and significant association between age and depression. The discrepancy in findings between this study and the broader body of research highlights the complexity and potentially nuanced nature of the relationship between age and depression, suggesting that cultural, societal, or methodological differences may play a role in shaping these outcomes.

5.3.2 Gender

This study revealed a significant association between gender and depression, a finding corroborated by numerous other studies regardless of the criteria utilized for depression assessment (Baraki, Tessema, and Demeke, 2020). One possible reason for this result could be the cultural or societal factors that influence how gender roles and expectations manifest, thereby impacting mental health outcomes differently for men and women. Additionally, biological differences and hormonal variations between genders may also contribute to the observed association. However, it's essential to consider that findings can vary across different populations and settings, as evidenced by the study conducted in India, which found no such association (Rastogi *et al.*, 2019).

5.3.3 Education level

A noteworthy correlation emerged between education level and the prevalence of depression ($P = 0.010 < 0.05$), with illiterate patients exhibiting the highest depression rates. This finding resonates with studies by Baraki, Tessema, and Demeke (2020) and Islam, *et al.*, (2022) these studies found that the patients with high educational status were found to have less depression. However, contrasting results were observed by Alagizy *et al.* (2020), who noted a higher incidence of psychiatric morbidity among educated women (54.8%) compared to the illiterate women (45.2%). This discrepancy underscores the complexity of the relationship between education and mental health, suggesting that other factors may also play a role in determining the prevalence of depression.

5.3.4 Marital status

This study showed that there was no significant association between marital status and depression ($p=0.484$). However, many studies showed a significant association between marital status and depression as the study done by Alagizy *et al.* where results illustrated that married woman showed much higher prevalence of depression than single women. In our opinion, married women were more depressed because they have families to take care of, which is the biggest commitment in their lives (Alagizy *et al.*, 2020).

5.3.5 Occupation

There was a relationship between occupation and the prevalence of depression ($P = 0.002 < 0.05$). On the other hand, results of Alagizy *et al.* showed that depression was more prevalent among the unemployed (97.7%), but without statistically significant difference (Alagizy *et al.*, 2020). This supported by Ell (Ell, 2005) and Hassan et al (Hassan, 2015) who found that low-income are characterized by the prevalent of anxiety and depression due to unlikely of receiving any treatments. However, due to lack of further literature that correlates depression among cancer patients with occupational factors, this significance in this study can

be interpreted as being the result of lack of proper follow up or self-care among patients. In addition, the commonly low pay grade and the high costs of health services might be contributing to deteriorating of mental well-being as in our findings.

5.3.6 Residency

This study showed that, there was no significant association between residency and depression (P= 0.738) as other studies were (P= 0.797) in Palestine and Bangladesh (P=0.457) (Sadaqa *et al.*, 2022).

5.4 Association between clinical profiles and depression

5.4.1 Cancer treatment setting

This study identified a significant association between cancer treatment setting and the prevalence of depression (P= 0.004). Notably, the prevalence of depression was higher among outpatients (50.7%) compared to inpatients (30.6%). This finding aligns with previous research, such as the study by Rastogi *et al.* (2019), which reported a significant association indicating a higher prevalence of depression in outpatient settings compared to inpatient settings by 5-16%. Furthermore, Walker *et al*.'s systematic review supports these findings, revealing prevalence rates of depression ranging from 5%–16% in outpatients and 4%–14% in inpatients (Walker *et al.*, 2013).

5.4.2 Cancer type

This study revealed a significant association between cancer type and depression (p = 0.027). Consistently, other studies conducted in the UK, such as the research by Caruso *et al.* (2017), have also demonstrated a significant correlation between cancer type and depression. Additionally, a study done by Zeilinger, *et al.*, investigated the prevalence of depression among individuals with various types of cancer (Zeilinger *et al.*, 2022).

5.4.3 Cancer stage

This study revealed no significant association between the stage of cancer and depression (P = 0.101). In contrast, previous studies, such as the one by

Tabassum *et al.* (2022), have shown a significant association between cancer stage and depression ($P < 0.05$). This discrepancy may suggest a potential limitation in our study, as the stage data were obtained from patient files, possibly resulting in inaccuracies due to patients' lack of precise knowledge about their cancer stage.

5.4.4 Type of cancer treatment

This study shows that there was a significant association between the type of treatment and depression, this significant association was found in the patients receiving chemotherapy. In literature review, include 15 studies of depression prevalence in patients receiving Chemotherapy 14 shows there was a significant association, like our study results.

5.4.5 Response to treatment

There was a significant association between response to treatment and the prevalence of depression ($\mathcal{X}^2 = 6.908$, $P = 0.032 < 0.05$).

The prevalence of depression was high among those who had regression response 60.0%. A systemic review of 211 articles revealed that the prevalence of depression during treatment was 14%, 9% in the first year following diagnosis and 8% a year or more after treatment (Niedzwiedz *et al.*, 2019).

5.4.6 Treatment side effect

There was a significant association between side effect of treatment and the prevalence of depression ($P = 0.013 < 0.05$) with prevalence being high among those who had treatment side effect (86.7%). Pandey *et al.* evaluated the effect of chemotherapy on distress, anxiety, and depression in 117 patients using distress inventory for cancer (Pandey *et al.*, 2006). The mean distress score was 24; 15.38% of patients were found to have anxiety, while 16.23% patients had depression. This result may be pertained to the psychological consequences cancer patients go through due to chemo/radiotherapy side effects, which push patients to insurmountable agony.

5.4.7 Duration of cancer

The lack of association between the duration since diagnosis and the prevalence of depression observed in this study may be deemed inconclusive, suggesting the need for meticulous long-term follow-up to draw definitive conclusions. Such an approach was exemplified by Burgess *et al*., who conducted an observational cohort study in London involving 222 women with early breast cancer. Their findings revealed that nearly 50% of women experienced depression, anxiety, or both in the year following diagnosis, with rates decreasing to 25% in the subsequent years and 15% by the fifth year (Burgess *et al.*, 2005). The point prevalence of depression was noted to decline from 33% at diagnosis to 15% after one year. Furthermore, approximately 45% of those experiencing recurrence reported depression, anxiety, or both within three months of diagnosis.

5.4.8 Comorbidity

This study revealed no statistically significant association between co-morbidity and the prevalence of depression. However, recent research conducted in Spain found that both obesity and hypertension exhibited the highest prevalence alongside depression among cancer patients (Petrova *et al.*, 2021). In contrast, a study in the Netherlands reported that hypertension was the most prevalent co-morbidity among colorectal cancer cases. Additionally, heart disease emerged as more prominently associated with colorectal cancer, with diabetes representing 20% and 15% respectively (Vissers *et al.*, 2013).

5.5 Association between patient's lifestyle and depression

5.5.1 Smoking

This study shows no relation between smoking and depression among cancer patients. However, Smith, and Washington, (2014) reported that the prevalence of depression among cancer patients who smoke is high compared to non-smokers.

5.5.2 Physical activity

While this study did not detect a significant association between physical activity and depression (p = 0.106), it's noteworthy that numerous other studies have reported such a connection. For instance, Craft *et al.* (2011) conducted research demonstrating that regular physical activity is indeed linked to a reduction in depression symptoms.

5.5.3 Chewing Khat

This study indicates that there's no significant correlation between chewing khat and depression among cancer patients. Conversely, Negesa, Gadisa, Kitaba, and Fufa (2024) discovered that patients who consumed khat were twice as likely to experience depression compared to those who abstained from it.

5.5.4 Taking shamma

Shamma, a form of smokeless tobacco, is commonly used in some regions, particularly in the Middle East and East Africa (Alsanosy, Mahfouz, Gaffar, & Khatib, 2013). While research on the direct relationship between shamma use and depression specifically among cancer patients is limited, this study shows no relation between depression among cancer patient and taking shamma.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

1. A much higher prevalence of cancer among females compared to their male counterparts; which necessitates further research with a bigger sample size is suggested to investigate the difference in the actual prevalence of cancer among men and women specifically.

2. The overall prevalence of depression was 47.1 % with the results found escalating with increasing age

3. When it came to age, a gradual increase pattern, yet, without any statistical significance. Therefore, a cohort study module is suggested to further extrapolate the relationship between patients' age and the increasing susceptibility to developing depression.

4. Type of cancer is an important predictor for depressive symptoms, with breast and female genital cancer patients being highly burdened.

5. The results also reflect the neglect cancer patients suffer from regarding mental health support; whether before, during, or after treatment.

6. Considering a personalized treatment approach, physicians should take into account the high prevalence of psychiatric comorbidities; especially among women, and include psychiatric consultations as an integral part of any treatment plan.

6.2 Recommendation

Based on the finding of this study, it's crucial to provide comprehensive support and interventions to address mental health needs for cancer patients. Here are some recommendations based on research finding:

1. **Screening Protocols**: Implement routine screening protocols for depression in cancer patients at various stages of their treatment and survivorship. Validated

screening tools such as the Patient Health Questionnaire (PHQ-9) can be utilized.

2. **Multidisciplinary Approach**: Encourage a multidisciplinary approach involving oncologists, psychologists, psychiatrists, nurses, and social workers to address the complex needs of cancer patients. Collaboration among these professionals ensures holistic care.
3. **Psychoeducation**: Provide psychoeducation to cancer patients about the common psychological challenges they may face, including depression. Educating patients about the signs and symptoms of depression can empower them to seek help early.
4. **Pharmacological Interventions**: Consider pharmacological interventions, such as antidepressant medications, for cancer patients with moderate to severe depression. Collaborate closely with psychiatrists or psycho-pharmacologists to determine the most appropriate medication regimen considering potential interactions with cancer treatments.
5. **Mindfulness and Relaxation Techniques**: Integrate mindfulness-based interventions and relaxation techniques into supportive care programs. Mindfulness meditation, yoga, and progressive muscle relaxation have shown promise in reducing depressive symptoms and improving overall well-being in cancer patients.
6. **Physical Activity Programs**: Encourage participation in structured physical activity programs tailored to the individual capabilities and preferences of cancer patients. Regular exercise has been associated with reductions in depression and anxiety symptoms among cancer survivors.
7. **Addressing Social Support Needs**: Recognize the importance of social support in mitigating depression among cancer patients. Facilitate connections with family members, friends, and support networks. Social workers can assist in identifying resources and addressing practical concerns.
8. **Continued Monitoring and Follow-up**: Implement a system for continued monitoring of patients' mental health throughout their cancer journey. Regular follow-up appointments provide opportunities to assess treatment efficacy, address emerging concerns, and provide ongoing support.

9. **Culturally Sensitive Care**: Ensure that support services and interventions are culturally sensitive and tailored to the diverse needs of cancer patients. Respect cultural beliefs, values, and preferences when designing and delivering care.

By integrating these recommendations into clinical practice, healthcare providers can enhance the quality of care for cancer patients and improve their psychological well-being amidst the challenges of diagnosis and treatment.

6.3 Limitations and strengths

This study presents both strengths and limitations. A primary limitation is the inability to generalize the results to all cancer patients in Yemen, as not all individuals with cancer are registered at the National Oncology Center in Sana'a city. Additionally, the study's cross-sectional design prevents the investigation of causal relationships.

On the other hand, a notable strength of this study is its pioneering nature, being the first investigation conducted at this center. Consequently, the findings serve as a valuable foundation for future research endeavors in this area.

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Appendix

نحن طلاب المستوى الخامس في الطب البشري من الجامعة الاماراتية الدولية نهدف في هذا الاستبيان الى تقييم مدى انتشار الاكتئاب عند المصابين بمرض السرطان والعوامل المساعدة على حدوثه لدى المرضى الواصلين الى مركز الاورام في المستشفى الجمهوري في صنعاء علما بان هذا الاستبيان سوف يستخدم لغرض اكمال بحث التخرج فقط وان معلوماتكم سوف تكون محفوظة في اطار الخصوصية ونتمنى منكم الشفافية في الاجابات والتعاون معنا ونتمنى لكم دوام الصحة والعافية.

اوافق على اجابة الاسئلة المدرجة في هذا الاستبيان بكل وضوح.

*Socio-demographic characteristics:		
1- Sex	Male [ ]	Female [ ]
2- Age		
3- Marital status	Single [ ] Widowed [ ]	Married [ ] Divorced [ ]
4- Education	Primary school [ ] University [ ]	Secondary school[ ] Illiterate [ ]
5- Residency	Urban [ ]	Rural [ ]
6- Occupation	Housewife [ ] Employed [ ]	Unemployed [ ] Students [ ]
*Medical sample characteristics:		
1- Cancer treatment setting	Inpatient [ ]	Outpatient [ ]
2- Tumor entity	breast [ ] Colorectal [ ] Female genital organ [ ] Stomach/esophagus [ ] Head and neck [ ] Pancreas [ ] Brain [ ] Testes [ ] Soft tissue [ ]	Prostate [ ] Lung [ ] Hematological [ ] Kidney/urinary tract[ ] Bladder [ ] Skin [ ] Hepatobiliary [ ] Thyroid [ ] Other [ ]
3- Stage of cancer	Stage 1 [ ] Stage 3 [ ] Other [ ]	Stage 2 [ ] Stage 4 [ ] Unknown [ ]
4- Type of treatment	Radiation [ ] Surgery [ ] Chemotherapy/radiation [ ] Chemotherapy/Radiation/Surgery [ ]	Chemotherapy [ ] Surgery/chemotherapy [ ] Radiation/surgery[ ]
5- Response to treatment	Progression [ ]	Remission [ ] Stationary[ ]
6- Side effect of treatment	Present [ ]	Absent [ ]

7- Duration since diagnosis

8- Co-morbidity
Hypertension [ ] Diabetes [ ]
Heart disease [ ] COPD/Asthma [ ]
Obesity [ ] kidney disease [ ] Blood diseases [ ]

*Life Style Characteristics:

1- Smoking	Yes [ ]	No [ ]
2- Shamma taking	Yes [ ]	No [ ]
3- Chewing khat	Yes [ ]	No [ ]
4- Physical activity/exercise	Yes [ ]	No [ ]

*Patient Health Questionnaire (PHQ-9)
Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly everyday
1-Little interest or pleasure in doing things.	0	1	2	3
2-Feeling down, depressed, or hopeless.	0	1	2	3
3-Trouble falling, staying asleep or sleeping too much.	0	1	2	3
4-Feeling tired or having little energy.	0	1	2	3
5-Poor appetite or overeating.	0	1	2	3
6-Feeling bad about yourself- or that you are a failure or have let yourself or your family down.	0	1	2	3
7-Trouble concentrating on things, such as reading newspaper or watching television.	0	1	2	3
8-Moving or speaking so slowly that other people could have noticed. Or the opposite- being so fidgety or restless that you have been moving around a lot more than usual.	0	1	2	3
9-Thoughts that you would be better off dead, or of hurting yourself.	0	1	2	3

-------- + --------- + ---------

Total ----------

10-If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get your work, take care of things at home, or get along with other people?

Not difficult [ ]
Somewhat difficult [ ]
Very difficult [ ]
Extremely difficult [ ]

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
الجامعة الإماراتية الدولية

استبيان لدراسة بحثية
خاصة ببحث التخرج لطلاب الطب البشري
الدفعة الخامسة ـ المجموعة (E)

نحن طلاب المستوى الخامس في الطب البشري من الجامعة الاماراتية الدولية نهدف في هذا الاستبيان الى تقييم مدى انتشار الاكتئاب عند المصابين بمرض السرطان والعوامل المساعدة على حدوثه لدى المرضى الواصلين الى مركز الاورام في المستشفى الجمهوري في صنعاء علما بان هذا الاستبيان سوف يستخدم لغرض اكمال بحث التخرج فقط وان معلوماتكم سوف تكون محفوظة في إطار الخصوصية ونتمنى منكم الشفافية في الاجابات والتعاون معنا ونتمنى لكم دوام الصحة والعافية.

اوافق على اجابة الاسئلة المدرجة في هذا الاستبيان بكل وضوح.

*البيانات الشخصية والاجتماعية:		
١- الجنس	ذكر ( )	انثى ( )
٢- العمر		
٣- الحالة الاجتماعية	اعزب ( )	متزوج/ة ( )
	مطلق ( )	ارمل/ة ( )
٤- مستوى التعليم	ابتدائي ( )	ثانوي ( )
	جامعي ( )	غير متعلم ( )
٥- محل الاقامة	المدينة ( )	القرية ( )
٦- الوظيفة	ربة منزل( )	غير موظف( )
	موظف ( )	طالب ( )
*خصائص العينة الطبية:		
١- اعداد علاج السرطان	مرضى داخليين( )	مرضى خارجيين( )
٢- نوع السرطان	الثدي ( )	البروستات ( )
	القولون( )	الرئة ( )
	امراض النساء للجهاز التناسلي( )	الدم ( )
	المعدة/المري ( )	الكلى/الجهاز البولي( )
	الراس والرقبة ( )	المثانة ( )
	البنكرياس ( )	الجلد ( )
	الدماغ ( )	الكبد والمرارة( )
	الخصية ( )	الغدة الدرقية ( )

	الانسجة الرخوة ( )اخرى ( )
٣- مرحلة السرطان	الاولى ( ) الثانية ( ) الثالثة( ) الرابعة ( ) اخرى( ) غير معروف ( )
٤- نوع العلاج	اشعاعي ( ) كيميائي ( ) جراحي ( ) جراحي\كيميائي( ) جراحي\اشعاعي( ) كيميائي\اشعاعي( ) جراحي\كيميائي\اشعاعي ( )
٥- الاستجابة لنوع العلاج	تفاقم ( ) تحسن ( ) مستقر ( )
٦- الاثار الجانبية لعلاج السرطان	يوجد ( ) لا يوجد ( )
٧- مدة الاصابة منذ تشخيص المرض	
٨- الاعتلال المشترك	ارتفاع ضغط الدم ( ) السكري ( ) امراض القلب ( ) امراض الصدر المزمنة( ) السمنة ( ) امراض الكلى ( ) امراض الدم ( )

*نمط الحياة لدى المرضى والعادات السيئة :

١- التدخين	نعم ( )	لا ( )
٢- تعاطي الشمة	نعم ( )	لا ( )
٣- تعاطي القات	نعم ( )	لا ( )
٤- ممارسة الرياضية	نعم ( )	لا ( )

*استبيان عن صحة المرضى -9 :(PHQ-9)

خلال الاسبوعين الماضيين كم مرة عانيت من المشاكل التالية :

	ولا مرة	عدة ايام	اكثر من نصف الايام	تقريبا كل يوم
1-قلة الاهتمام او قلة الاستمتاع بممارسة بالقيام باي عمل	0	1	2	3
2-الشعور بالحزن او ضيق الصدر او اليأس	0	1	2	3
3-صعوبة في النوم او نوم متقطع او النوم اكثر من المعتاد	0	1	2	3
4-الشعور بالتعب او بامتلاك القليل جدا من الطاقة	0	1	2	3
5-قلة الشهية او الزيادة في تناول الطعام عن المعتاد	0	1	2	3
6-الشعور بعدم الرضا عن النفس او الشعور بانك قد	0	1	2	3

اخذلت نفسك او عائلتك				
7-صعوبة في التركيز مثلا اثناء قراءة الصحيفة او مشاهدة التلفاز	0	1	2	3
8-بطء في الحركة او بطء في التحدث عما هو معتاد لدرجة ملحوظة من الاخرين/ او على العكس من ذلك التحدث بسرعة وكثرة الحركة اكثر من المعتاد	0	1	2	3
9-راودتك افكار بانه من الافضل لو كنت ميتا او افكار بان تقوم بإيذاء النفس	0	1	2	3

…… : Total score = 0 +…… + …… + ……

10-اذا اشرت الى اية من المشاكل اعلاه، فإلى اية درجة صعبت عليك هذه القيام بعملك، الاعتناء بالأمور المنزلية، او الانسجام مع اشخاص اخرين ؟
ليست هناك اي صعوبة بالغة التعقيد ( ) هناك بعض الصعوبات ( ) هناك صعوبات شديدة ( ) هناك صعوبات ( )

وزارة الصحة العامة والسكان
المركز الوطني لعلاج الأورام
إدارة الموارد البشريه

(إرســـاليه)

المحتـــرم
الأخ / مدير دائرة العيادات

المحتـــرم
الأخ مدير دائرة الرقود

المحتـــرم
مدير دائرة التمريض

بعد التحية ،،،

مرسل إليكم طالبات الطب البشري المستوى الخامس وهن في مرحلة الاستبيان :

١. نوال العزي الملاحي
٢. هدى محمد حسن الهجام
٣. اميمه علوان علي الجند
٤. روان عبدالله فرج ونس
٥. زينب عبدالواحد قاسم
٦. سحر حسين علي
٧. ايات محمودالاهدل
٨. ازال احمد شعبين
٩ . سمر محمد المخلافي
١٠. سوسن عبده الشرعبي
١١. اميمه منصور العامري

وعليـــــه : يتم التعاون معهم في بحثهم والذي بعنوان (مدى انتشار الاكتئاب والعوامل المؤثرة للمرضى المصابين بالسرطان في المركز الوطني لعلاج الأورام / صنعاء) وذلك لمدة ٣ ايام فقط ابتداء من ٧/١١/٢٠٢٣م .

أحلام الشهدي
رئيس قسم القوى العاملة

محمد عبده غراد
مدير الموارد البشريه

د. عبدالله دحان ثوابه
المـديـــر العـــام

خلاصة

المقدمة : الاكتئاب هو مشكلة صحية عقلية منتشرة تؤثر على ملايين الأفراد في جميع أنحاء العالم .عندما يقترن الاكتئاب بالتحديات الجسدية والعاطفية للسرطان، فإنه يمكن أن يؤثر بشكل كبير على صحة مرضى السرطان ونتائج علاجهم .الاكتئاب لدى هذه الفئة من السكان ليس فقط نتيجة للضائقة النفسية المرتبطة بالمرض ولكن أيضا نتيجة للتغيرات الفسيولوجية الناجمة عن السرطان وعلاجاته .وفي اليمن، لا تزال البيانات المحلية حول مدى انتشار الاكتئاب بين مرضى السرطان والعوامل المصاحبة المرتبطة به ضعيفة.

الهدف : الغرض من هذه الدراسة هو تحديد مدى انتشار والعوامل المصاحبة للاكتئاب لدى مرضى السرطان في المركز الوطني للأورام في مدينة صنعاء.

المنهجية : شملت هذه الدراسة المقطعية 350 مشاركاً وأجريت في المركز الوطني للأورام في مدينة صنعاء . وأجريت مقابلات مع المشاركين المؤهلين الذين قدموا الموافقة؛ تم تقييم الاكتئاب باستخدام استبيان صحة المريض .(PHQ-9) 9 تم استخدام برنامج SPSS الإصدار 25 لتحليل البيانات .بدأ جمع البيانات بعد الحصول على موافقة من كلية الطب والعلوم الصحية في الجامعة الإماراتية الدولية، بالإضافة إلى أذونات من المركز الوطني للأورام والمشاركين الأفراد.

النتيجة : من بين 350 مريض سرطان، (64%) 224 إناث و (36%) 126ذكور، نصف المرضى (50%) أميون، بمتوسط عمر45.83 ، 14.68 سنة، 78.6% متزوجون، .60.3 يعيش % منهم في المناطق الريفية ويعيش 39.7% في المناطق الحضرية، وكان (82.3%) 288 من المشاركين مرضى خارجيين .كان سرطان الثدي هو السرطان الأكثر شيوعاً(26.3%) ، حيث تناولت (48.3%) 169 من المشاركات العلاج الكيميائي . وكان معدل انتشار الاكتئاب بين مجتمع الدراسة47.1 ٪ .وبلغ معدل انتشار الاكتئاب 49.1% بين من تجاوزت أعمارهم 45 عامًا، و 34.5%بين المشاركين الذين تتراوح أعمارهم بين 31 و 45عامًا، و 16.4%بين من تقل أعمارهم عن 30 عامًا .وكانت العلاقة بين الجنس وانتشار الاكتئاب ذات دلالة إحصائية .وكانت هناك علاقة ذات دلالة إحصائية بين التعليم ومستوى المهنة وانتشار الاكتئاب .زاد معدل انتشار الاكتئاب بين المشاركين في العيادات الخارجية (50.7%) مقارنة مع المشاركين في المرضى الداخليين (30.6%) مع وجود علاقة ذات دلالة إحصائية بين بيئة علاج السرطان وانتشار الاكتئاب .كان معدل انتشار الاكتئاب مرتفعًا بشكل ملحوظ بين المشاركين الذين تلقوا العلاج الكيميائي(43%) ، كما أظهرت الاستجابة للعلاج ارتباطًا كبيرًا أيضًا؛ حيث كان معدل انتشار الاكتئاب مرتفعاً بين أولئك الذين لديهم استجابة تراجعية .(60.0%) كان هناك ارتباط كبير بين الآثار الجانبية للعلاج وانتشار الاكتئاب، مع ارتفاع معدل الانتشار بين أولئك الذين أصيبوا به الآثار الجانبية للعلاج.

الاستنتاج :إن معدل انتشار الاكتئاب مرتفع لدى مرضى السرطان، وغالباً ما يمر دون أن يلاحظه أحد أو يتم التغاضي عنه .إنه أمر حتمي لإجراء فحص روتيني للاكتئاب لدى مرضى السرطان قبل وأثناء وبعد تلقي أي

شكل من أشكال العلاج .تم تحديد المرضى. يجب إحالة المصابين بالاكتئاب على الفور إلى طبيب نفسي لإجراء تحقيق شامل في عوامل الخطر المحتملة وفي وقت مبكر التدخل لمنع تعطيل الإدارة في الوقت المناسب .تمثل هذه الدراسة خطوة أولية حاسمة في تسليط الضوء على العوامل مما يؤثر على الصحة العقلية، مما قد يعيق أنظمة العلاج الحالية .من خلال المساعدة في تنفيذ وتعزيز فهو يساهم في تحقيق النتائج في إدارة السرطان، بما في ذلك الصحة العقلية، والامتثال للعلاج، وبروتوكولات العلاج الشاملة بشكل كبير لتحسين رعاية مرضى السرطان.

الكلمات المفتاحية : السرطان، الاكتئاب، العوامل المصاحبة

الجمهورية اليمنية
الجامعة الإماراتية الدولية
كلية الطب والعلوم الصحية
قسم طب المجتمع

مدى انتشار الاكتئاب والعوامل المصاحبة له لدى مرضى السرطان في المركز الوطني للأورام، مدينة صنعاء

بحث مقدم لقسم طب المجتمع - كلية الطب والعلوم الصحية - الجامعة الإماراتية الدولية لاستكمال نيل درجة البكالوريوس في الطب العام والجراحة

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