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RESEARCH ARTICLE

THE COMORBIDITY OF DEPRESSION AND ANXIETY AMONG SAUDI BOARD RESIDENTS IN DIFFERENT HEALTH TRAININGPROGRAMSINAL-AHSA, SAUDI ARABIA, 2024

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Abstract

Introduction:-Depression and anxiety disorders are among the most prevalent mental illnesses worldwide; they affect a person's functionality, causing long-term impairments. The prevalence of depression and anxiety in the general population is increasing, and healthcare providers are at risk of developing these mental illnesses, which impact the care provided to patients, the quality of life of the physicians, and the level of work productivity.

Aim:-to examine the prevalence and factors associated with the comorbidity of depression and anxiety among training physicians in various health training programs under the Ministry of Health (MOH) in Al-Ahsa, Saudi Arabia.

Methods:-This is a descriptive cross-sectional study conducted among training physicians in various health care training programs under the Ministry of Health in Al-Ahsa, Saudi Arabia. Data collected from different fields from a total of the study population 471 of a total population sampling. The data was collected through a validated self-administered questionnaire form. Data was analyzed using IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, NY, United States). Descriptive statistics were used to calculate the frequency and percentage of categorical variables.

Results:-A total of 221 professionals were included in the data collection from a total population of 471. The majority, 157 (71.0%), were between 24 and 29 years old, and 111 (50.2%), were females. Around 131 (59.3%) were married, and 111 (50.2%) reported receiving up to 5 on-call shifts per month. A total of 160 (72.4%) were not exercising, 188 (85.1%) were non-smokers, 187 (84.6%) did not complain of chronic diseases, and 195 (88.2%) did not complain of psychiatric illness. The participants showed mild 35.3%, moderate depression 33%, and moderately- severe 6.8% or severe depression 12.2%. Severe depression was highest in General surgery and orthopedics specialties (50% both). The residents, 49.8% (n=110), had no or minimal anxiety; others showed mild 22.6%, moderate 12.7%, and severe depression 14.9%. Severe anxiety was highest in Orthopedics (50%) and Psychiatry specialties (33.3%). Comorbidity of depression and anxiety was highest in Orthopedics, followed by Obstetrics and Gynecology, internal medicine, and pediatrics.

Conclusion: The comorbidity of depression and anxiety are prevalent in residents with different level in different specialities. Improving the mentalhealth of training residents and providing new interventions to prevent,recognize,

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and manage this issue in our community settings, especially in high-risk specialties, will improve overall healthcare quality

Introduction:-

Depression

One of the most prevalent mental illnesses in the world, depression, can affect a person's functionality and result in long-term impairments in all facets of life. Globally, depression affects up to 5% of the population. The definition of depression is a chronically low mood that impairs many aspects of a patient's functioning and is accompanied by a loss of interest in previously enjoyed activities. Disturbances in sleep, focus, and appetite, constant weariness, guilt, and suicidal thoughts or attempts are other signs of depression (1). Suicidal ideation is a comprehensive phrase used to describe a variety of concepts, including thoughts and wants. It can be either passive or active, depending on whether the patient has plans to commit suicide or not, as well as a desire to die (2). Although the exact etiology of depression is still unknown, it is recognized to be influenced by several interrelated social, psychological, and biological factors.

Research has indicated that depression is hereditary; almost one-third of all instances are thought to be inherited(1).Obesity, financial difficulties, a lack of social support, experiencing stressful life events such as parental loss or a history of abuse during childhood, having other medical conditions like multiple sclerosis, dissatisfaction with one's quality of life, excessive workload at work, and burnout at work are all risk factors linked to depression (1, 3). Gender is a significant risk factor; women are twice as likely as men to have depression. It was discovered that the prevalence of depression in relation to gender varies by region in the Gulf and Saudi Arabia. In Saudi Arabia, up to one-third of all high school female students suffer from depression, whereas in Oman, it only affects less than one-fifth of all female adolescents. This is also the case in Egypt (3). Research indicates that there is a major risk factor for depression associated with family history; those who have first-degree relatives with a diagnosis of depression are three times more likely to be affected than those who do not (4).

Research has indicated that depression is quite common throughout the world, with an estimated 300 million people affected. The percentage of people who are identified and successfully receive treatment is still low, even though there are established guidelines for diagnosing depression and effective treatment programs are available (5).

Depression screening is crucial and vital. Depression is a very common and extremely incapacitating aspect of health care. Patient health questionnaires, such as the Patient Health Questionnaire-2 (PHQ-2) or the Patient Health Questionnaire-9 (PHQ-9), are frequently used by healthcare providers to screen for depression. Both have extremely sensitive and specific levels for identifying and evaluating the severity of depression in individuals (6,7). A popular self-administered tool for determining the severity of depression is the PHQ-9. Research has demonstrated that the PHQ-9 is a viable and trustworthy tool for screening for depression and determining its severity, having been developed over many years by numerous researchers (7).

Nine items on the PHQ-9 are designed to test for signs of depression and disability over the course of the previous two weeks. There are four possible answers for each question, with a score ranging from zero (not at all) to three (almost every day), for a total of twenty-seven points that examine the existence and severity of depression (6). A score of 20–27 indicates that the screening for depression is positive and that it is severe; a score of 15–19 indicates that the depression is moderately severe; a score of 10–14 indicates that the depression is moderate; a score of 5–9 indicates that the depression is mild; and a score of 4–1 indicates that the depression is minimal. When it comes to screening for depression, PHQ-9 has a greater specific level than PHQ-2, while PHQ-2 has a similar sensitivity level. It is advised that everyone over the age of eighteen be eligible for a depression test, regardless of whether they have any risk factors for the condition (5).

Two interest and mood-related multiple-choice items on the PHQ-2 have a score range of 0 to 3, with a total score of three or above being regarded as a positive screening result (6,7).

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria for Major Depressive Disorder (MDD) must be checked to confirm the diagnosis whenever the screening result is positive (6). The DSM-5 states that a patient must exhibit at least five symptoms from all the criteria for an MDD diagnosis, with at least one of those symptoms having to be a loss of interest or a poor mood that has persisted for at least the previous two weeks. Sleep difficulty, poor attention, disturbed appetite, psychomotor agitation, low energy, guilt, and suicidal thoughts are some additional symptoms (6,8). Suicidal thoughts or attempts to ensure patient safety, together with interventions such as regular and close monitoring or even hospitalization when required, must be considered when evaluating patients with depressed symptoms (4). The

DSM-5 for MDD is consistent with the diagnosis of depression and uses the total score result to determine how severe depression is (6,8).

Laboratory tests are useful in ruling out any potential medical condition that could mimic depression, even though they are not useful in diagnosing depression (4). A complete blood count (CBC), thyroid profile, analysis of iron and vitamin B12 levels for potential anemia, liver enzyme levels, and renal function tests are among the laboratory tests used to determine the patient's preferred medication based on their health (6).

There is a clear correlation between depression and substantial functional disability. All people with depression have functional impairment, according to studies, and almost two-thirds of all people with depression have a severe kind of impairment associated with the condition. It has been discovered that the functional impairment of people with depression is comparable to that of people with organic chronic diseases like diabetes or even cancer.

Patients with depression are more likely to seek medical attention and be admitted to the hospital than people without depression. They are also more likely to attempt suicide and suffer from unemployment twice as frequently as people without depression. Because depression can worsen the condition of coexisting cardiovascular diseases, significantly increase mortality following myocardial infarction or unstable angina, and raise the risk of hypertension and stroke events, patients who suffer from depression are at an increased risk of mortality and mobility rate. The greatest important effect of depression on death rates has been shown to be suicide; research has shown that people with depression are eleven times more likely to attempt suicide than people without depression (9).

The true issue with depression is that the majority of those who experience it do not seek treatment; research indicates that as many as 60% of all individuals with depression do not seek treatment. The embarrassment associated with having mental illnesses or the stigma of not embracing them could be the cause of this (4). Some patients appear with a severe form of depression that requires inpatient therapy due to delusional thoughts, hallucinations, or suicidal thoughts, even though the most prevalent types are mild to moderate and can be safely treated as an outpatient. There are pharmacological, non-pharmacological, or a combination of both types of depression treatment available. Treatment options include electroconvulsive therapy (ECT), psychotherapies, and antidepressant drugs (10). Tricyclic antidepressants, monoamine oxidase inhibitors, selective serotonin reuptake inhibitors (SSRIs), and serotonin-norepinephrine reuptake inhibitors (SNRIs) are among the various classes of antidepressant drugs; each group has a distinct degree of safety and side effects (11). Because SSRIs are safe, effective, and have few, manageable side effects, they are regarded as the primary and first pharmacological line for treating mild to moderate depression. Venlafaxine and duloxetine are examples of SNRIs, while citalopram, sertraline, fluoxetine, and paroxetine are examples of SSRIs.

As the second-line therapeutic option if SSRIs are unable to produce improvement or a response, SNRIs play a crucial role during treatment. Atypical antidepressants include, for instance, mirtazapine and bupropion. When treating difficult-to-treat depression, atypical antidepressants can be administered either alone or in combination (4). The treatment of severe forms of depression typically involves a combination of pharmacological and non-pharmacological therapies, which can take the form of drugs and psychological therapy (11). Clinical response and improvement with drugs often take four to six weeks, which is why close follow-up is essential for continual monitoring and ensuring compliance with the treatment plan. Psychological therapy can be undertaken as a stand-alone initial intervention for patients with mild to moderate depression who prefer not to use medication. Pregnancy, breastfeeding, or attempting to conceive are additional reasons to consider commencing treatment with psychiatric therapy. Although there are other forms of psychological therapies, cognitive behavioral therapy (CBT) is the most helpful for depression (10,11). Helping patients recognize and alter any maladaptive beliefs or behaviors is the primary goal of cognitive behavioral therapy (4).

Anxiety disorders

When a person encounters pressures, threatened situations, or topics where they must take action to stop the threat from harming them, they experience normal anxiety. Anxiety is typically accompanied by physical symptoms such as tightness in the chest and palpitations, as well as bewilderment and the admission of fear. If normal anxiety continues to interfere with functioning, it may be unhealthy. According to estimates, one in ten people will have impairment due to anxiety disorders, which are very common (12). Anxiety disorder is the most prevalent mental health problem among all mental disorders. Anxiety disorders can present in several forms, including generalized anxiety disorder (GAD), agoraphobia, panic disorder, and different types of phobias, such as social phobia. Certain anxiety disorders, such as social phobia and generalized anxiety disorder, emerge during childhood. Conversely, other forms typically emerge throughout early adulthood or later, such as agoraphobia and panic disorder. Research indicates that the prevalence of anxiety disorders is

estimated to be between twenty and thirty percent among individuals in early adulthood, while it affects up to ten to fourteen percent of those in later adulthood (13). Due to the predominantly chronic and substantially debilitating nature of anxiety disorders, they rank sixth among the most burdensome health-related conditions. Anxiety disorders result in substantial and profound impairment across various facets of patients' lives, adversely affecting their quality of life, occupational performance, physical functioning, overall psychological well-being, social interactions, and leading to increased healthcare utilization (14). Concerning the risk factors associated with anxiety disorders, there are several risks that are typically multifactorial and have been linked together. The primary risk factors include gender, exposure to stressors or stressful life events, the presence of chronic health conditions such as autoimmune diseases, a history of mental illnesses, current mental health issues, low socioeconomic status, residing in impoverished areas, and experiences of trauma during childhood, such as parental separation or loss. A significant risk factor for anxiety disorders, particularly generalized anxiety disorder (GAD), is the presence of a family history of mental health issues, especially among parents (15,16).

When comparing males and females regarding the association with anxiety disorders, female individuals face a risk of developing these disorders that is twice that of their male counterparts (17). Low self-esteem can be influenced by a variety of factors, including a challenging family environment, exposure to multiple traumatic events such as childhood sexual abuse, a significant family history of depression, and gender. These elements can have a direct impact on an individual's mental health, heightening the risk for anxiety disorders and major depressive disorder (MDD) (16). Some variables may help avoid or reduce the likelihood of acquiring anxiety disorders. These include receiving social support, learning healthy coping techniques for dealing with life's pressures, and elements relating to the good environment in which the person lives (18). Different types of anxiety illnesses have comparable symptoms. These symptoms include fear or worrying about situations or objects that are caricatured as pathological due to their severity, being disproportionate to the threats, and causing functional impairment that requires medical attention.

Patients experiencing dread of threatening circumstances or objects experience palpitations, chest tightness or pain, perspiration, abdominal discomfort, restlessness, disorientation, and impaired focus (13). Other specific symptoms of anxiety disorders include social fear or concern regarding performance, unexplained panic attacks without a known trigger, and avoidance behaviors associated with threats. The prevalence of each type of anxiety disorder that seeks medical assistance and visits primary health care clinics is six percent in the case of GAD, thirteen percent in the case of panic disorder, whether with or without agoraphobia, and approximately five percent in the case of social phobia (19). Anxiety disorders, like any other mental illness, can result in a variety of comorbidities, which have a substantial impact on the patient's quality of life. Some of these comorbidities include an increased risk of developing other mental disorders, such as depression or substance misuse, a higher risk of developing new anxiety disorders over time, and an increased risk of developing or worsening physical disorders (18). Depression is recognized as the most prevalent mental illness among various mental disorders, often occurring alongside anxiety disorders. Research indicates that around fifty percent to two-thirds of individuals experiencing anxiety disorders also contend with depression. The correlation between anxiety disorders and depression has resulted in a 3-5-fold increase in the incidence of depression among those affected by anxiety disorders (13).

Health care should identify high-risk patients for anxiety disorders and establish the diagnosis to give effective treatment to prevent disabilities and substantial life impairment. In general care, Generalized Anxiety Disorder-7 (GAD-7) should be used to screen for anxiety disorders due to its 93% sensitivity and 97% specificity. GAD-7 screens for anxiety disorders and assesses severity to allow doctors to continue treatment if positive. Anxiety disorders can be screened using GAD-2 or GAD-7. The screening methods differ in that GAD-7 is a seven-item scale and GAD-2 is a quick version of GAD-7 that contains only the first two questions, which are crucial to anxiety disorder screening. GAD-7 is a self-administered survey based on the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) to identify anxiety disorders like GAD, social phobia, panic disorder, and post-traumatic stress disorder (20,21). GAD-7 contains seven questions to evaluate patients for anxiety disorder symptoms, limitations, and functional impairment over the past two weeks. The four options for each question range from "not at all" to "nearly daily" and are scored from zero to three. A total score between 5 and 10 indicates a mild anxiety disorder screening, 10-14 indicates a moderate screening, and 14 or more indicates a severe screening. GAD-7 survey is an established and reliable diagnostic tool for primary care and all general populations. Positive GAD-2 has only the first two questions with multiple-scoring answers. If the overall score is three or higher, further evaluation is needed (21).

When screening results show anxiety disorders, DSM-5 criteria should be used to confirm the diagnosis, which includes excessive worrying about almost everything for at least six months, with difficulty controlling these worries. Three of the

six other symptoms—restlessness, poor focus, weariness, irritability, muscle tension, and sleep disturbance—must also be present. Patients' occupational and social impairments are used to confirm the diagnosis. All cases of anxiety disorder must rule out other psychological or physical issues to be diagnosed (22).
Various effective treatment options exist for anxiety disorders, demonstrating the ability to alleviate overall symptoms of anxiety and enhance the quality of patients' lives. There exist both pharmacological and non-pharmacological approaches for the treatment of anxiety disorders (13). A variety of psychological therapies, including cognitive behavioral therapy (CBT) and the self-help method, are available as first-line treatments for anxiety disorders. The most well-known method for treating anxiety disorders is cognitive behavioral therapy (CBT). CBT emphasizes the need to identify and replace unhealthy beliefs with more constructive ones, as well as the need to expose patients to real or imagined frightening stimuli to break destructive patterns of behavior. When psychological therapy fails to alleviate symptoms, when anxiety disorder is severe or persistent, or when another medical condition, such as depression and anxiety disorder, is present, pharmacological treatment may be considered as a first line of defense. It is possible to use medications from different classes, such as SSRIs and SNRIs (13, 19).

Among the SSRIs is sertraline, a medicine that works well for treating anxiety disorders alone but fails to alleviate symptoms when other mental health issues, including depression, are present. Three excellent choices for treating GAD include duloxetine, escitalopram, and venlafaxine. Another anxiolytic medicine is benzodiazepine, which is useful in treating most anxiety disorders but has adverse effects, including tolerance and reliance; hence, it is only used for limited periods of time with restrictions while monitoring. When dealing with issues like treatment resistance or co-morbidities, it is common practice to employ a hybrid approach that incorporates elements of both approaches (13). The treatment strategy should consider the patient's previous successful treatment, preference for all choices, other physical or psychological problems, age or gender, and future pregnancy planning (19).
Identifying risk factors and adhering to a clear guideline for detection and treatment are essential in the prevention of anxiety disorders. Implementing effective prevention strategies is crucial, achievable through the reduction of negative risk factors associated with anxiety disorders or the enhancement of protective factors related to these disorders (23).
It has been discovered that anxiety and depression are closely connected and highly comorbid (24, 25).
Approximately one-fourth of patients with mental illnesses experience comorbidity of anxiety disorders and depression. Anxiety is present in over eighty percent of patients with depression, while depression is found in up to ninety percent of patients with anxiety disorders (24).

Literature Review
We conducted a search of the PubMed database for prior studies. The determinants of prior studies were in English, published within the last decade, and related to the comorbidity of depression and anxiety among training physicians in various health training programs. Meta-analyses and systematic reviews have been conducted to examine the global prevalence of depression among adolescents in one study (26) and within general populations in two additional studies (27, 28). The studies indicated that 34% of participants exhibited depressive symptoms, with a point prevalence of Major Depressive Disorder (MDD) at 8%. The prevalence was found to be the highest in Africa, Asia, and the Middle East (26). The prevalence of depression in general populations is increasing, potentially due to changes in the calculation of depression rates, variations in help-seeking behavior, or shifts in healthcare professionals' perceptions of the condition (27). In 2017, the global incidence of depressive cases increased by 49.86 percent compared to 1990 (28). A systematic review was conducted to examine the prevalence of anxiety disorders within the general population. This study estimated 301.39 million prevalent cases globally, indicating a 50% increase in anxiety disorders since 1990 (29). A global meta-analysis and systematic review was conducted among resident physicians to determine the prevalence of depressive symptoms and depression. The study indicated a prevalence of 28.8%, with projections suggesting an increase over time (30).

Three cross-sectional studies were conducted in South Korea among workers (31), Australian doctors (32), and in the U.S. on anesthesiology training physicians from their first year to their first year after graduation (33). The three studies focused on depression, revealing that individuals working over 69 hours per week exhibited a greater likelihood of experiencing moderate to severe depressive symptoms compared to those working 40 hours per week (31). About 60% of doctors who reported ever feeling significantly sad sought some type of professional care; privacy and confidentiality were the most often stated impediments to seeking help (32). Moreover, 32% and 12% have distress or depression, respectively, among anesthesiology residents. A higher chance of distress and depression was found to be associated with more hours worked per week (33). Findings regarding risk factors associated with depression indicated that employed women and individuals with lower income levels exhibited a more pronounced correlation between extended work hours and depressive symptoms (31), females had higher odds of seeking help, as did locally trained doctors and senior doctors

(32), and the perception of workplace resource availability, and ability to maintain a work-life balance were associated with a lower overall risk of depression and distress (33). Variations in help-seeking behaviors were associated with medical specialties; psychiatrists exhibited a higher propensity to seek professional assistance, whereas surgeons, pathologists, and radiologists demonstrated a lower likelihood of seeking professional or medical help for depression (32). The prevalence of depression and anxiety among Brazilian medical residents was 46.9% and 56.6%, respectively. Risk factors such as anxiety, burnout, extended duty hours, lack of days off, prevalence of psychological abuse, and female gender were independently correlated with depression. Additionally, female gender, advanced age, prolonged work hours, work-life conflicts, unsupervised assistance, and depression were independently linked to anxiety. The findings were obtained from a cross-sectional study conducted in Brazil, focusing on medical residents in training programs(34). Two cross-sectional studies were conducted to study the prevalence of depression and anxiety among physicians in France (35) and in China (36).

These studies showed similar results related to anxiety, in which 32.3% reported having an anxiety disorder, 8.1 % had an MDD, and less than one in five received psychotherapy or antidepressant medications in France (35). 25.67 % of physicians reported having anxiety symptoms, 28.13 % reported having depressed symptoms, and 19.01 % reported having both anxiety and depression symptoms in China (36). Being a woman and drinking more coffee were directly linked to a higher rate of anxiety disorders. On the other hand, harassment, drinking alcohol, and not knowing how to deal with sickness well at first were all linked to major depression and anxiety disorders (35). Anxiety and depressive symptoms were related to long working hours (above 60 hours per week), frequent night shifts (twice or more per week), poor self-reported physical health, and irregular physical exercise (36). Anxiety disorders and depression were both positively correlated with each other, according to a cross-sectional study performed among emergency physicians in China (37).

Two cross-sectional studies were conducted in Saudi Arabia focusing on anxiety disorders, depression, and anxiety among adults aged 18 and older (38), including all medical residents (39). Variations in the prevalence of depression and anxiety among the targeted populations were observed, with findings indicating that 12.4% of the nationwide population in Saudi Arabia was at risk for GAD and 12.7% for MDD. In comparison, 65.8% of medical residents reported experiencing symptoms of depression, while 58.3% reported symptoms of anxiety. Diagnosis and treatment rates were notably low, with only 12.5% of individuals receiving treatment for anxiety and 0.5% for depression (38). Identified risk factors include female sex, lower income, and smoking, which are associated with both Generalized Anxiety Disorder (GAD) and Major Depressive Disorder (MDD). Participation in volunteer activities, regular physical exercise, and the pursuit of daily hobbies serve as protective factors within the general population. The residency degree (R5) and gender (female) were independently associated with anxiety symptoms. Family medicine specialty and female gender were independent predictors of depressive symptoms among medical residents (39). Two cross-sectional studies were conducted involving all medical residents in Saudi Arabia.

The initial study was conducted in Jeddah (40), whereas the subsequent study took place in Makkah (41). The studies indicated that the prevalence of diagnosed depression among residents of Jeddah was 75%, categorized by severity: mild depression at 35.6%, moderate depression at 34.2%, and severe depression at 6% (40). In Makkah, the prevalence of anxiety was recorded at 39.5%, while the prevalence of depression was noted at 20.9% (41). Residents engaged in emergency and surgical programs exhibit a heightened risk of developing moderate to severe depression relative to other specialties. Contributing factors include extended work hours, age, sleep duration, and exposure to injustice, all of which elevate the overall risk of anxiety and depression among resident physicians (41). A recent cross-sectional study found a 10% prevalence of moderately severe to severe depression among residents in family medicine in Riyadh, with a significant correlation between the severity of depression and burnout. A recent cross-sectional study conducted in Makkah examined the prevalence of anxiety disorders and depression among surgical residents and doctors. The findings revealed that 11.8% of surgeons reported a previous history of anxiety or depression, while 30.7% experienced anxiety and 27.5% experienced depression (42). Anxiety demonstrated a significant correlation with participation in the Saudi board program, working over nine hours, and experiencing work-related stress. Depression among surgeons is significantly associated with age, particularly between 50 and 59 years, in addition to factors such as career satisfaction and work-related stress (43). This study aimed to examine the prevalence and factors associated with the comorbidity of depression and anxiety among training physicians in various health training programs under the Ministry of Health (MOH) in Al-Ahsa, Saudi Arabia.

Aim of the study:-

To study the prevalence and factors related to comorbidity of depression and anxiety among the training physicians in different health training programs pertaining to Ministry of Health (MOH) in Al-Ahsa in Saudi Arabia.

Objectives:

- To identify the prevalence of comorbidity of depression and anxiety among the training physicians in different health training programs pertaining to MOH in Al-Ahsa in Saudi Arabia
- To study the factors related to the comorbidity of depression and anxiety among the training physicians in different health training programs pertaining to MOH in Al-Ahsa in Saudi Arabia.

Hypotheses:

- There will not be a high prevalence of the comorbidity of depression and anxiety among the training physicians in health training programs pertaining to MOH in Al-Ahsa in Saudi Arabia.
- There will be some factors related to the comorbidity of depression and anxiety among the training physicians in health training programs pertaining to MOH in Al-Ahsa in Saudi Arabia like the main speciality, gender, and presence of on-call as part of work.

Materials and methods:-

Study design and setting

This descriptive cross-sectional study was conducted among training physicians in various health care training programs under the Ministry of Health from March 2024 to May 2025 in Al-Ahsa, in the eastern province region of the Kingdom of Saudi Arabia.

Study population

Training physicians in health training programs pertaining to MOH in Al-Ahsa in Saudi Arabia.
Inclusion Criteria:

- Saudi and non-Saudi training physicians in health training programs in MOH, Al-Ahsa, Saudi Arabia.
- Gives the complete and proper information.

Exclusion Criteria:

- Those who didn't complete at least 6 months of training without freeze.

Sampling technique

Total population sampling (universal convenient sampling technique).

Sample size

Considering the variables and outcome of the study, a total of the study population (471), comorbidity of depression and anxiety on training physicians in various health training programs under the Ministry of Health, with an allowable margin error of 5%, at a 95% confidence interval, a total of 221 professionals from various fields were included in the data collection.

Data collection tools: -

The data was collected by a self-administered questionnaire form, sent by email. The questionnaire was filled out by the training physicians.

The questionnaire was divided into four sections: Socio-Demographic section that included age, gender, nationality, marital status, having children, living with family, monthly income, residency year, training center, and having on-call as part of work. The second was the Lifestyle and medical history section that included exercise, smoking, current or history of chronic medical illnesses, current or history of psychiatric illnesses, ever receiving any professional psychological help, and previous knowledge about psychological support for trainees (Daem).

The third was the Depression assessment section that included the PHQ-9 screening instrument in both Arabic and English versions. The PHQ-9 is a valid and reliable tool for measuring symptoms of depression in all individuals, and the scores are divided into five categories: a score of <5 indicates minimal or no symptoms of depression, a score of 5 to 9 indicates mild symptoms, a score of 10 to 14 indicates moderate symptoms, a score of 15–19 indicates moderately severe symptoms, and of 20 or more indicates severe symptoms. The fourth was the anxiety disorders assessment section that included the GAD-7 screening instrument. Arabic and English versions of the questionnaire were provided. The scores are classified into four categories: a score of <5 indicates no or minimal anxiety symptoms, a score of 5 to 9 indicates mild symptoms, a score of 10 to 14 indicates moderate symptoms, and a score of 15 or more indicates severe symptoms.

Data analysis: -

Data was entered into Microsoft 365 (Microsoft® Corp., Redmond, WA, United States), and analyses were carried out using IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, NY, United States). Descriptive statistics were used to summarize the data by calculating the frequency and percentage of categorical variables. Pearson's Chi-squared test revealed statistically significant differences in depression and anxiety prevalence regarding sociodemographic data, lifestyle, and history of clinical and psychiatric illness ($p < 0.05$).

Ethical consideration: -

Official ethical approval was obtained from Alahsa Health Cluster Research Ethical Committee (REC) with Reference No.: REC- 11/EP/2024. Consent was accepted as a prerequisite for data collection. All collected data were kept confidential and were used only for research.

Budget
This study was entirely self-funded by the researchers.

Results*:* -

Sociodemographic characteristics

Overall, a total of 242 residents responded to the online survey. Of these, 21 respondents were excluded due to missing more than one entry in the questionnaire. From the total population (471), the number of residents in each specialty was a total of 133 in family medicine speciality, 19 in intensive care unit speciality, 58 in pediatric speciality, 79 in internal medicine speciality, 6 in Psychiatry speciality, 3 in cardiac surgery speciality, 10 in urology speciality, 23 in radiology speciality, 30 in preventive medicine speciality, 4 neurology speciality, 25 in general surgery speciality, 13 in orthopedic speciality, 7 in neurosurgery speciality, 8 in ear, nose throat speciality, 3 in dermatology speciality, and a total of 50 in obstetric and gynecology speciality.

The majority, 157 (71.0%), were between 24 and 29 years old. Nearly half of the respondents, 111 (50.2%), were females. Nearly all the residents included in the study, 220 (99.5%), were Saudis. Around 131 (59.3%) were married, and 123 (55.7%) were without children. A high proportion of the respondents were living with their families, 192 (86.9%), with a monthly income of 15,000-20,000 SAR, 186 (84.2%), and were satisfied with their income, 115 (52.0%). The best part of the shared residents was family medicine 89 (40.3%), in Primary health care (PHC) - Al-Ahsa Academy of Family Medicine 86 (38.9%), and in the first residence year 89 (40.3%). More than half of the respondents reported receiving up to 5 on-call shifts per month, 111 (50.2%). The full sociodemographic characteristics are summarized in [Table 1].

Table 1: Demographic data of the study respondents (n=221)

Demographics		Frequency (%)
Age	<24 Y	1 (0.5)
	24-29 Y	157 (71.0)
	30-34 Y	57 (25.8)
	35-39 Y	6 (2.7)
Gender	Males	110 (49.8)
	Females	111 (50.2)
Nationality	Saudi	220 (99.5)
	Non-Saudi	1 (0.5)
Marital status	Single	85 (38.5)
	Married	131 (59.3)
	Divorced	3 (1.4)
	I don't prefer to tell	2 (0.9)
Do you have children?	Yes	98 (44.3)
	No	123 (55.7)
Do you live with your	Yes	192 (86.9)

family?	No	29 (13.1)
Monthly income	< 15,000 SR	5 (2.3)
	15,000-20,000 SR	186 (84.2)
	> 20,000 SR	30 (13.6)
Are you satisfied with your current income?	Satisfied	115 (52.0)
	Neutral	78 (35.3)
	Unsatisfied	28 (12.7)
Training center in Al-Ahsa, Saudi Arabia	King Fahad Hospital-Al-Hofuf (KFHH)	58 (26.2)
	Maternity & Children's Hospital in Al-Ahsa (MCH)	45 (20.4)
	Primary health care (PHC) - Al-Ahsa Academy of Family Medicine	86 (38.9)
	Psychiatric Hospital in Al-Ahsa	3 (1.4)
	Al Jabr Eye and ENT Hospital in Al-Ahsa	8 (3.6)
	Prince Sultan Cardiac Center	3 (1.4)
	PHC Al Salhea	6 (2.7)
	Others	12 (5.4)
Specialty	Family medicine	89 (40.3)
	Preventive medicine	16 (7.2)
	Internal medicine	17 (7.7)
	Pediatric	17 (7.7)
	Obe& Gynae	27 (12.2)
	Cardiac surgery	3 (1.4)
	ICU	13 (5.9)
	General Surgery	4 (1.8)
	Neurosurgery	2 (0.9)
	Orthopedic	2 (0.9)
	Radiology	9 (4.1)
	Urology	7 (3.2)
	Dermatology	3 (1.4)
	Neurology	2 (0.9)
	ENT	7 (3.2)
	Psychiatry	3 (1.4)
Residency year	R1	89 (40.3)
	R2	52 (23.5)
	R3	44 (19.9)
	R4	26 (11.8)
	R5	10 (4.5)
Number of your on-calls per month	No on-call	48 (21.7)
	5 times or less per month	111 (50.2)
	> 5 times per month	62 (28.1)

Lifestyle and medical history characteristics

A high proportion of the respondents, 160 (72.4%), were not exercising at least 150 minutes per week, and were non-smokers, 188 (85.1%). Most of the shared residents, 187 (84.6%), did not complain of any chronic diseases. The main reported diseases were G6PD and bronchial asthma, 8 (3.6%). Many of the participants, 195 (88.2%), did

not complain of any psychiatric illness. The main reported disease was depression, 14 (6.3%). The bulk of them, 182 (82.4%), had not received professional psychological help. However, 128 (57.8%) have heard about SCFHS psychological support for trainees (Daem). The lifestyle and medical history are summarized in [Table 2].

Table 2: Lifestyle and medical history of the study respondents (n=221)

Lifestyle and medical history		Frequency (%)
Are you exercising at least 150 minutes per week?	Yes	61 (27.6)
	No	160 (72.4)
Are you a smoker?	Yes	33 (14.9)
	No	188 (85.1)
Do you have a current or past history of chronic medical illnesses?	No	187 (84.6)
	HTN	5 (2.3)
	G6PD	8 (3.6)
	PCOS	3 (1.4)
	DM	5 (2.3)
	Asthma	8 (3.6)
	Thyroid	3 (1.4)
	Anemia	2 (0.9)
Do you have a current or past history of psychiatric illnesses?	No	195 (88.2)
	Depression	14 (6.3)
	Anxiety	7 (3.2)
	ADHD	1 (0.5)
	Bipolar	1 (0.5)
	Burnout	1 (0.5)
	Overthinking	1 (0.5)
	Panic disorder	1 (0.5)
Have you ever received any professional psychological help?	No	182 (82.4)
	Yes, from the outpatient clinic	15 (6.8)
	Yes, from a psychological care app	12 (5.4)
	Yes, from psychological support for trainees (Daem)	2 (0.9)
	Yes, from a relative or friend	6 (2.7)
	Yes, from others	4 (1.8)
Have you heard about SCFHS psychological support for trainees (Daem)?	Yes	128 (57.9)
	No	93 (42.1)

Depression prevalence among Saudi residents

According to the residents' response, only 12.7% (n=27) had no or minimal depression. However, many of the participants showed mild and moderate depression, 35.3% (n=78) and 33% (n=73) respectively. Moreover, some residents had moderately severe or severe depression, 6.8% (n=15) and 12.2% (n=27) respectively [Figure 1]. Depression prevalence varied across different demographic groups [Table 3]. Among residents aged 24–29 years (the highest frequency of the participants), 36.9% had mild depression, 15.2% had no or minimal depression, and 14.6% had moderate depression, while 6.4% and 10.8% exhibited moderately severe and severe depression, respectively. Regarding gender, moderately severe and severe depression were more common in females, 8.1% and 14.4% respectively. A greater number of females (35.1%) recorded mild depression, while the superiority of males (40%) showed no or minimal depression.

The preponderance of Saudi residents had mild or minimal depression (35%, 33.2% respectively). The lowest percentage of severely depressed residents was the married ones (9.9%). Severely depressed residents were more likely to be divorced (33.3%) or single (14.1%). Having no children or living alone was accompanied by a higher rate of severe depression among the participants (15.4%, 20.7% respectively). More monthly income and salary satisfaction were accompanied by a lower rate of severe depression. Concerning the training center, the centers whose residents reported minimal depression were Prince Sultan Cardiac Center (66.7%), PHC Al-Salhea, and Al-Jabr Eye and ENT Hospital (50% both). The first and fourth years of residence were accompanied by the highest score of severe depression (16.9%, 15.4% respectively). More on-calls per month were accompanied by a higher rate of severe depression. Smoking and lack of regular exercise for 150 minutes per week were accompanied by a higher rate of severe depression (15.2%, 14.4% respectively). Healthy residents with no history of chronic disease or psychiatric illness and awareness about Daem SCFHS psychological support had a higher rate of minimal depression (35.8%, 35.9% and 41.4%) respectively [Table 3].

Fig.1: Depression prevalence among the Saudi board residents

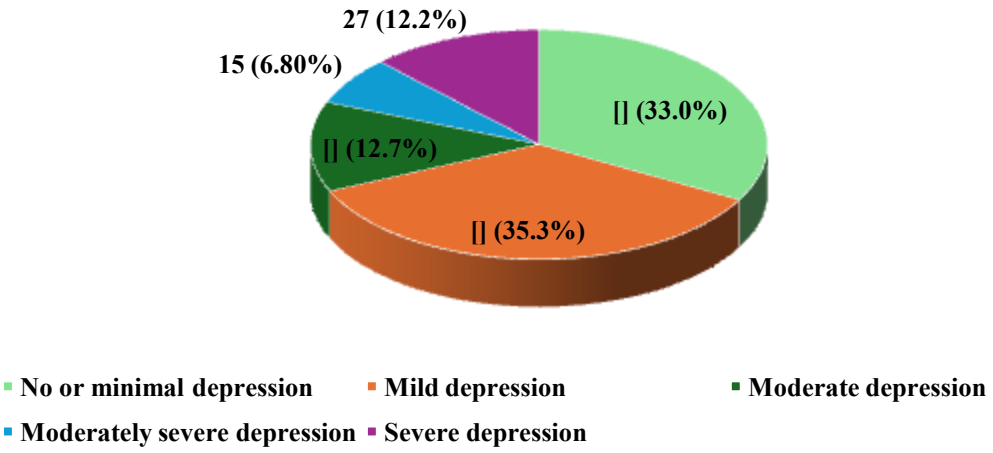

Table 3: Sociodemographic characteristics, lifestyle, medical history, and different levels of depression

Sociodemographic characteristics, lifestyle, and medical history		No or minimal depression	Mild depression	Moderate depression	Moderately severe depression	Severe depression	p value
		n (%)	n (%)	n (%)	n (%)	n (%)	
Age	<24 Y	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	0.337
	24-29 Y	49 (31.2%)	58 (36.9%)	23 (14.6%)	10 (6.4%)	17 (10.8%)	
	30-34 Y	20 (35.1%)	19 (33.3%)	5 (8.8%)	5 (8.8%)	8 (14.0%)	
	35-39 Y	4 (66.7%)	1 (16.7%)	0 (0.0%)	0 (0.0%)	1 (16.7%)	
Gender	Males	44 (40.0%)	39 (35.5%)	10 (9.1%)	6 (5.5%)	6 (5.5%)	0.142
	Females	29 (26.1%)	39 (35.1%)	18 (16.2%)	9 (8.1%)	16 (14.4%)	
Nationality	Saudi	73 (33.2%)	77 (35.0%)	28 (12.7%)	15 (6.8%)	27 (12.3%)	0.765
	Non-Saudi	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Marital status	Single	25 (29.4%)	30 (35.3%)	11 (12.9%)	7 (8.2%)	12 (14.1%)	0.715

	Married	48 (36.6%)	46 (35.1%)	16 (12.2%)	8 (6.1%)	13 (9.9%)	
	Divorced	0 (0.0%)	1 (33.3%)	1 (33.3%)	0 (0.0%)	1 (33.3%)	
	I don't prefer to tell	0 (0.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	1 (50.0%)	
Do you have children?	Yes	39 (39.8%)	34 (34.7%)	12 (12.2%)	5 (5.1%)	8 (8.2%)	0.232
	No	34 (27.6%)	44 (35.8%)	16 (13.0%)	10 (8.1%)	19 (15.4%)	
Do you live with your family?	Yes	68 (35.4%)	63 (32.8%)	25 (13.0%)	15 (7.8%)	21 (10.9%)	0.051
	No	5 (17.2%)	15 (51.7%)	3 (10.3%)	0 (0.0%)	6 (20.7%)	
Monthly income	< 15,000 SR	1 (20.0%)	2 (40.0%)	1 (20.0%)	0 (0.0%)	1 (20.0%)	0.808
	15,000-20,000 SR	58 (31.2%)	68 (36.6%)	23 (12.4%)	14 (7.5%)	23 (12.4%)	
	> 20,000 SR	14 (46.7%)	8 (26.7%)	4 (13.3%)	1 (3.3%)	3 (10.0%)	
Are you satisfied with your current income?	Satisfied	48 (41.7%)	38 (33.0%)	12 (10.4%)	8 (7.0%)	9 (7.8%)	0.010*
	Neutral	18 (23.1%)	33 (42.3%)	13 (16.7%)	5 (6.4%)	9 (11.5%)	
	Unsatisfied	7 (25.0%)	7 (25.0%)	3 (10.7%)	2 (7.1%)	9 (32.1%)	
Training center in Al-Ahsa, Saudi Arabia	King Fahad Hospital-Al-Hofuf (KFHH)	16 (27.6%)	21 (36.2%)	8 (13.8%)	3 (5.2%)	10 (17.2%)	0.134
	Maternity & Children's Hospital in Al-Ahsa (MCH)	5 (11.1%)	17 (37.8%)	8 (17.8%)	7 (15.6%)	8 (17.8%)	
	Primary health care (PHC) - Al-Ahsa Academy of Family Medicine	39 (45.3%)	28 (32.6%)	8 (9.3%)	4 (4.7%)	7 (8.1%)	
	Psychiatric Hospital in Al-Ahsa	1 (33.3%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	
	Al Jabr Eye and ENT Hospital in Al-Ahsa	4 (50.0%)	2 (25.0%)	0 (0.0%)	1 (12.5%)	1 (12.5%)	
	Prince Sultan Cardiac Center	2 (66.7%)	0 (0.0%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	
	PHC Al Salhea	3 (50.0%)	2 (33.3%)	1 (16.7%)	0 (0.0%)	0 (0.0%)	
	Others	3 (25.0%)	7 (58.3%)	2 (16.7%)	0 (0.0%)	0 (0.0%)	
Residency year	R1	17 (19.1%)	35 (39.3%)	12 (13.5%)	10(11.2%)	15 (16.9%)	0.095
	R2	21 (40.4%)	21 (40.4%)	4 (7.7%)	3 (5.8%)	3 (5.8%)	
	R3	22 (50.0%)	10 (22.7%)	7 (15.9%)	1 (2.3%)	4 (9.1%)	
	R4	9 (34.6%)	9 (34.6%)	3 (11.5%)	1 (3.8%)	4 (15.4%)	
	R5	4 (40.0%)	3 (30.0%)	2 (20.0%)	0 (0.0%)	1 (10.0%)	
Number of your on-calls per	No on-call	24 (50.0%)	16 (33.3%)	6 (12.5%)	0 (0.0%)	2 (4.2%)	0.008*

month	5 times or less per month	38 (34.2%)	39 (35.1%)	14 (12.6%)	7 (6.3%)	13 (11.7%)	
	> 5 times per month	11 (17.7%)	23 (37.1%)	8 (12.9%)	8 (12.9%)	12 (19.4%)	
Are you exercising at least 150 minutes per week?	Yes	26 (42.6%)	26 (42.6%)	3 (4.9%)	2 (3.3%)	4 (6.6%)	0.023*
	No	47 (29.4%)	52 (32.5%)	25 (15.6%)	13 (8.1%)	23 (14.4%)	
Are you a smoker?	Yes	10 (30.3%)	13 (39.4%)	3 (9.1%)	2 (6.1%)	5 (15.2%)	0.915
	No	63 (33.5%)	65 (34.6%)	25 (13.3%)	13 (6.9%)	22 (11.7%)	
Do you have a current or past history of chronic medical illnesses?	No	67 (35.8%)	66 (35.3%)	21 (11.2%)	12 (6.4%)	21 (11.2%)	0.183
	HTN	1 (20.0%)	1 (20.0%)	(40.0%)	0 (0.0%)	1 (20.0%)	
	G6pD	2 (25.0%)	0 (0.0%)	1 (12.5%)	3 (37.5%)	2 (25.0%)	
	PCOS	0 (0.0%)	2 (66.7%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	
	DM	0 (0.0%)	2 (40.0%)	1 (20.0%)	0 (0.0%)	2 (40.0%)	
	Asthma	2 (25.0%)	4 (50.0%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	
	Thyroid	0 (0.0%)	2 (66.7%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	
	Anemia	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Do you have a current or past history of psychiatric illnesses?	No	70 (35.9%)	71 (36.4%)	22 (11.3%)	12 (6.2%)	20 (10.3%)	0.101
	Depression	0 (0.0%)	3 (21.4%)	5 (35.7%)	2 (14.3%)	4 (28.6%)	
	Anxiety	2 (28.6%)	2 (28.6%)	1 (14.3%)	1 (14.3%)	1 (14.3%)	
	ADHD	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Bipolar	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Burnout	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	
	Overthinking	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	
	Panic disorder	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Have you ever received any professional psychological help?	No	67 (36.8%)	63 (34.6%)	22 (12.1%)	12 (6.6%)	18 (9.9%)	0.236
	Yes, from the outpatient clinic	3 (20.0%)	5 (33.3%)	1 (6.7%)	1 (6.7%)	5 (33.3%)	
	Yes, from the psychological care app	0 (0.0%)	5 (41.7%)	3 (25.0%)	2 (16.7%)	2 (16.7%)	
	Yes, from psychological support for trainees (Daem)	0 (0.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	1 (50.0%)	
	Yes, from a relative or friend	2 (33.3%)	2 (33.3%)	2 (33.3%)	0 (0.0%)	0 (0.0%)	

	Yes (from others)	1 (25.0%)	2 (50.0%)	0 (0.0%)	0 (0.0%)	1 (25.0%)	
Have you heard about CFHS psychological support for trainees (Daem)?	Yes	53 (41.4%)	48 (37.5%)	17 (13.3%)	4 (3.1%)	6 (4.7%)	0.001 *
	No	20 (21.5%)	30 (32.3%)	11 (11.8%)	11 (11.8%)	21 (22.6%)	

*** = Significant (P-value is less than 0.05) Specialty of the residents and different levels of depression**

General surgery and orthopedics were the specialties encountered in severe depression (50% both), followed by internal medicine, Obstetric and Gynecology, and Pediatrics (23.5%, 18.5% & 17.6%) respectively. No or minimal depression was observed mainly in residents of cardiac surgery, followed by preventive medicine (66.7% and 56.3%), respectively with no significant variation [Fig. 2 & Table 4].

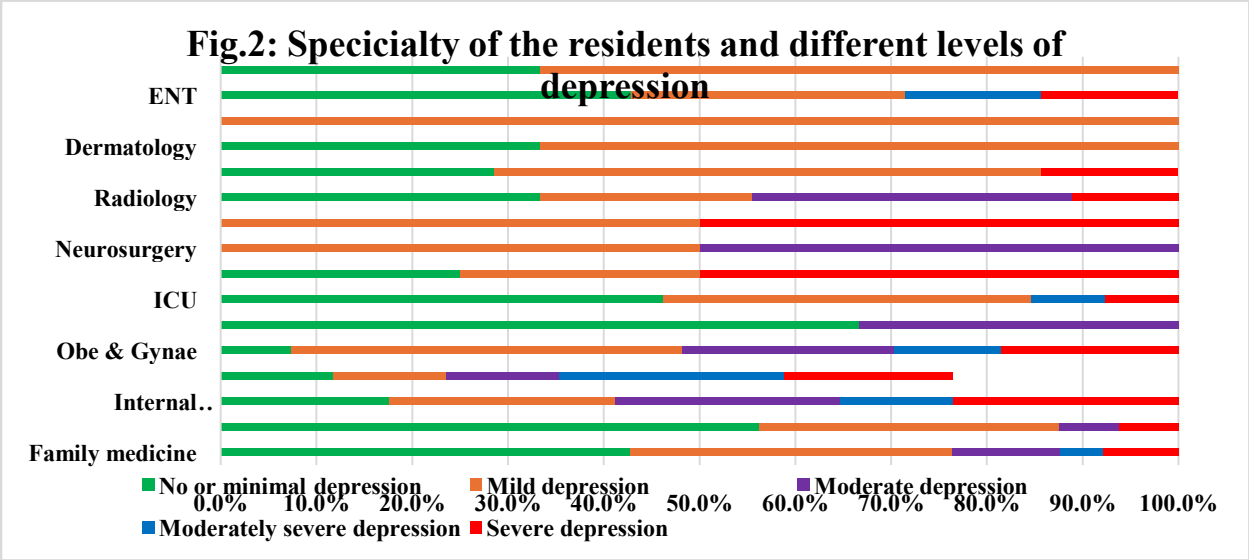

Table 4: Specialty of the residents and different levels of depression

Specialty		No or minimal depression	Mild depression	Moderate depression	Moderately severe depression	Severe depression	P value
		n (%)	n (%)	n (%)	n (%)	n (%)	
Specialty	Family medicine	38 (42.7%)	30 (33.7%)	10 (11.2%)	4 (4.5%)	7 (7.9%)	0.208
	Preventive medicine	9 (56.3%)	5 (31.3%)	1 (6.3%)	0 (0.0%)	1 (6.3%)	
	Internal medicine	3 (17.6%)	4 (23.5%)	4 (23.5%)	2 (11.8%)	4 (23.5%)	
	Pediatric	2 (11.8%)	2 (11.8%)	2 (11.8%)	4 (23.5%)	3 (17.6%)	
	Obe& Gynae	2 (7.4%)	11 (40.7%)	6 (22.2%)	3 (11.1%)	5 (18.5%)	
	Cardiac surgery	2 (66.7%)	0 (0.0%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	
	ICU	6 (46.2%)	5 (38.5%)	0 (0.0%)	1 (7.7%)	1 (7.7%)	
	General Surgery	1 (25.0%)	1 (25.0%)	0 (0.0%)	0 (0.0%)	2 (50.0%)	

	Neurosurgery	0 (0.0%)	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)
	Orthopedic	0 (0.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	1 (50.0%)
	Radiology	3 (33.3%)	2 (22.2%)	3 (33.3%)	0 (0.0%)	1 (11.1%)
	Urology	2 (28.6%)	4 (57.1%)	0 (0.0%)	0 (0.0%)	1 (14.3%)
	Dermatology	1 (33.3%)	2 (66.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Neurology	0 (0.0%)	2 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	ENT	3 (42.9%)	2 (28.6%)	0 (0.0%)	1 (14.3%)	1 (14.3%)
	Psychiatry	1 (33.3%)	2 (66.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

* = Significant (P-value is less than 0.05)

Anxiety prevalence among Saudi residents

According to the residents' response, nearly half, 49.8% (n=110), had no or minimal anxiety. However, the other half showed mild, moderate, and severe depression, 22.6% (n=50), 12.7% (n=28), and 14.9% (n=33) respectively [Figure 3]. Anxiety prevalence varied across different demographic groups [Table 5]. Among residents aged 24–29 years (the highest frequency of the participants), 50.3% had no or minimal anxiety, 21.7% had mild anxiety, and 12.7% had moderate anxiety, while 15.3% exhibited severe anxiety. Regarding gender, moderate and severe anxiety were more common in females, 15.3% and 19.8% respectively. A greater number of males (54.5%) recorded minimal anxiety, while the superiority of females (45%) showed no or minimal anxiety. The preponderance of Saudi residents had minimal or mild anxiety (50%, 22.3% respectively). The lowest percentage of residents with severe anxiety was the single ones (10.6%), followed by married, then divorced residents (16.8% and 33.3%), respectively. Having children or living alone was accompanied by a higher rate of severe anxiety among the participants (15.3%, 20.7% respectively). More monthly income and salary satisfaction were accompanied by a lower rate of severe anxiety. Concerning the training center, the centers whose residents reported no or minimal anxiety were Prince Sultan Cardiac Center (100%), Primary health care – Al-Ahsaa Academy of Family Medicine (57%), PHC Al-Salhea, and Al-Jabr Eye and ENT Hospital (50% both). The fourth and the years of residence were accompanied by the highest score of severe anxiety (23.1%, 19.1% respectively). More on-calls per month were accompanied by a higher rate of severe anxiety. Smoking and lack of regular exercise for 150 minutes per week were accompanied by a higher rate of severe anxiety (18.2% and 18.8% respectively). Healthy residents with no history of chronic disease or psychiatric illness and awareness about Daem SCFHS psychological support had a higher rate of minimal anxiety (51.3%, 53.3% and 57% respectively) [Table 5].

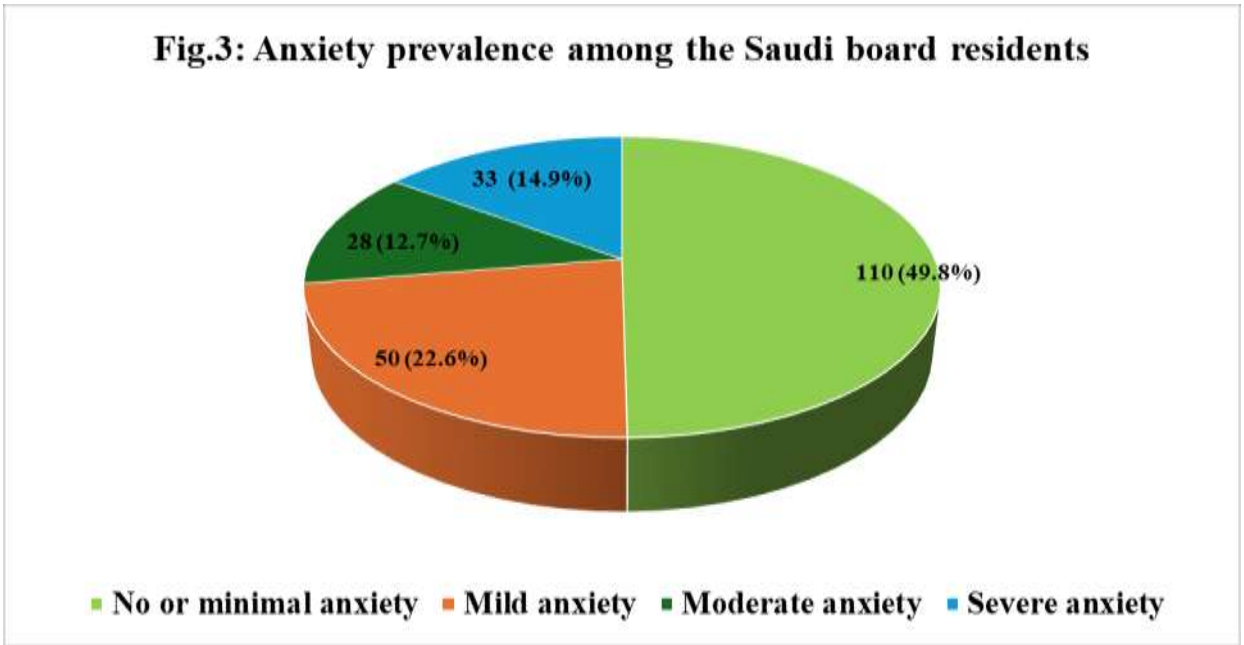

Table 5: Sociodemographic characteristics and different levels of anxiety

Sociodemographic characteristics, lifestyle, and medical history		No or minimal anxiety	Mild anxiety	Moderate anxiety	Severe anxiety	P value
		n (%)	n (%)	n (%)	n (%)	
Age	<24 Y	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	0.338
	24-29 Y	79 (50.3%)	34 (21.7%)	20 (12.7%)	24 (15.3%)	
	30-34 Y	26 (45.6%)	15 (26.3%)	8 (14.0%)	8 (14.0%)	
	35-39 Y	5 (83.3%)	1 (16.7%)	0 (0.0%)	0 (0.0%)	
Gender	Males	60 (54.5%)	28 (25.5%)	11 (10.0%)	11 (10.0%)	0.087
	Females	50 (45.0%)	22 (19.8%)	17 (15.3%)	22 (19.8%)	
Nationality	Saudi	110 (50.0%)	49 (22.3%)	28 (12.7%)	33 (15.0%)	0.329
	Non- Saudi	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	
Marital status	Single	38 (44.7%)	23 (27.1%)	15 (17.6%)	9 (10.6%)	0.278
	Married	70 (53.4%)	27 (20.6%)	12 (9.2%)	22 (16.8%)	
	Divorced	1 (33.3%)	0 (0.0%)	1 (33.3%)	1 (33.3%)	
	I don't prefer to tell	1 (50.0%)	0 (0.0%)	0 (0.0%)	1 (50.0%)	
Do you have children?	Yes	54 (55.1%)	18 (18.4%)	11 (11.2%)	15 (15.3%)	0.437
	No	56 (45.5%)	32 (26.0%)	17 (13.8%)	18 (14.6%)	
Do you live with	Yes	102	36	27	27	0.001*

your family?		(53.1%)	(18.8%)	(14.1%)	(14.1%)	
	No	8 (27.6%)	14 (48.3%)	1 (3.4%)	6 (20.7%)	
Monthly income	< 15,000 SR	3 (60.0%)	0 (0.0%)	0 (0.0%)	2 (40.0%)	0.527
	15,000-20,000 SR	93 (50.0%)	42 (22.6%)	23 (12.4%)	28 (15.1%)	
	> 20,000 SR	14 (46.7%)	8 (26.7%)	5 (16.7%)	3 (10.0%)	
Are you satisfied with your current income?	Satisfied	70 (60.9%)	23 (20.0%)	8 (7.0%)	14 (12.2%)	0.012*
	Neutral	29 (37.2%)	22 (28.2%)	15 (19.2%)	12 (15.4%)	
	Unsatisfied	11 (39.3%)	5 (17.9%)	5 (17.9%)	7 (25.0%)	
Training center in Al-Ahsa, Saudi Arabia	King Fahad Hospital-Al-Hofuf (KFHH)	28 (48.3%)	17 (29.3%)	5 (8.6%)	8 (13.8%)	0.29
	Maternity & Children's Hospital in Al-Ahsa (MCH)	17 (37.8%)	9 (20.0%)	10 (22.2%)	9 (20.0%)	
	Primary health care (PHC) - Al-Ahsa Academy of Family Medicine	49 (57.0%)	15 (17.4%)	10 (11.6%)	12 (14.0%)	
	Psychiatric Hospital in Al-Ahsa	1 (33.3%)	0 (0.0%)	0 (0.0%)	2 (66.7%)	
	Al Jabr Eye and ENT Hospital in Al-Ahsa	4 (50.0%)	2 (25.0%)	1 (12.5%)	1 (12.5%)	
	Prince Sultan Cardiac Center	3 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	PHC Al Salhea	3 (50.0%)	3 (50.0%)	0 (0.0%)	0 (0.0%)	
	Others	5 (41.7%)	4 (33.3%)	2 (16.7%)	1 (8.3%)	
Residency year	R1	36 (40.4%)	21 (23.6%)	15 (16.9%)	17 (19.1%)	0.065
	R2	28 (53.8%)	16 (30.8%)	6 (11.5%)	2 (3.8%)	
	R3	29 (65.9%)	5 (11.4%)	3 (6.8%)	7 (15.9%)	
	R4	10 (38.5%)	6 (23.1%)	4 (15.4%)	6 (23.1%)	
	R5	7 (70.0%)	2 (20.0%)	0 (0.0%)	1 (10.0%)	
Number of your on-calls per month	No on-call	31 (64.6%)	11 (22.9%)	2 (4.2%)	4 (8.3%)	0.036*
	5 times or less per month	55 (49.5%)	26 (23.4%)	12 (10.8%)	18 (16.2%)	
	> 5 times per month	24 (38.7%)	13 (21.0%)	14 (22.6%)	11 (17.7%)	
Are you exercising at least 150 minutes per week?	Yes	33 (54.1%)	19 (31.1%)	6 (9.8%)	3 (4.9%)	0.027*
	No	77 (48.1%)	31 (19.4%)	22 (13.8%)	30 (18.8%)	
Are you a smoker?	Yes	13 (39.4%)	9 (27.3%)	5 (15.2%)	6 (18.2%)	0.643
	No	97 (51.6%)	41 (21.8%)	23 (12.2%)	27 (14.4%)	
Do you have a current or past	No	96 (51.3%)	45 (24.1%)	21 (11.2%)	25 (13.4%)	0.028*

history of chronic medical illnesses?	HTN	1 (20.0%)	1 (20.0%)	2 (40.0%)	1 (20.0%)	
	G6pD	2 (25.0%)	0 (0.0%)	2 (25.0%)	4 (50.0%)	
	PCOS	3 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	DM	1 (20.0%)	1 (20.0%)	0 (0.0%)	3 (60.0%)	
	Asthma	3 (37.5%)	2 (25.0%)	3 (37.5%)	0 (0.0%)	
	Thyroid	2 (66.7%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	
	Anemia	2 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Do you have a current or past history of psychiatric illnesses?	No	104 (53.3%)	44 (22.6%)	22 (11.3%)	25 (12.8%)	0.052
	Depression	3 (21.4%)	3 (21.4%)	4 (28.6%)	4 (28.6%)	
	Anxiety	2 (28.6%)	2 (28.6%)	1 (14.3%)	2 (28.6%)	
	ADHD	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	
	Bipolar	0 (0.0%)	0 (0.0%)	1 (100.0%)	0 (0.0%)	
	Burnout	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	
	Overthinking	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	
	Panic disorder	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Have you ever received any professional psychological help?	No	100 (54.9%)	36 (19.8%)	22 (12.1%)	24 (13.2%)	0.058
	Yes, from the outpatient clinic	3 (20.0%)	5 (33.3%)	2 (13.3%)	5 (33.3%)	
	Yes, from a psychological care app	2 (16.7%)	5 (41.7%)	2 (16.7%)	3 (25.0%)	
	Yes, from psychological support for trainees (Daem)	0 (0.0%)	0 (0.0%)	1 (50.0%)	1 (50.0%)	
	Yes, from a relative or friend	3 (50.0%)	3 (50.0%)	0 (0.0%)	0 (0.0%)	
	Yes (from others)	2 (50.0%)	1 (25.0%)	1 (25.0%)	0 (0.0%)	
Have you heard about CFHS psychological support for trainees (Daem)?	Yes	73 (57.0%)	30 (23.4%)	11 (8.6%)	14 (10.9%)	0.014*
	No	37 (39.8%)	20 (21.5%)	17 (18.3%)	19 (20.4%)	

*** = Significant (P-value is less than 0.05)**

Specialty of the residents and different levels of anxiety

Orthopedics and Psychiatry were the specialties encountered in severe anxiety (50% and 33.3% respectively), followed by pediatrics (29.4%). On the other hand, all cardiac surgery and neurology residents (100%) showed no or minimal anxiety, followed by radiology and psychiatry residents (77.8% and 66.7%), respectively, with no significant variation [Fig. 4 & Table 6].

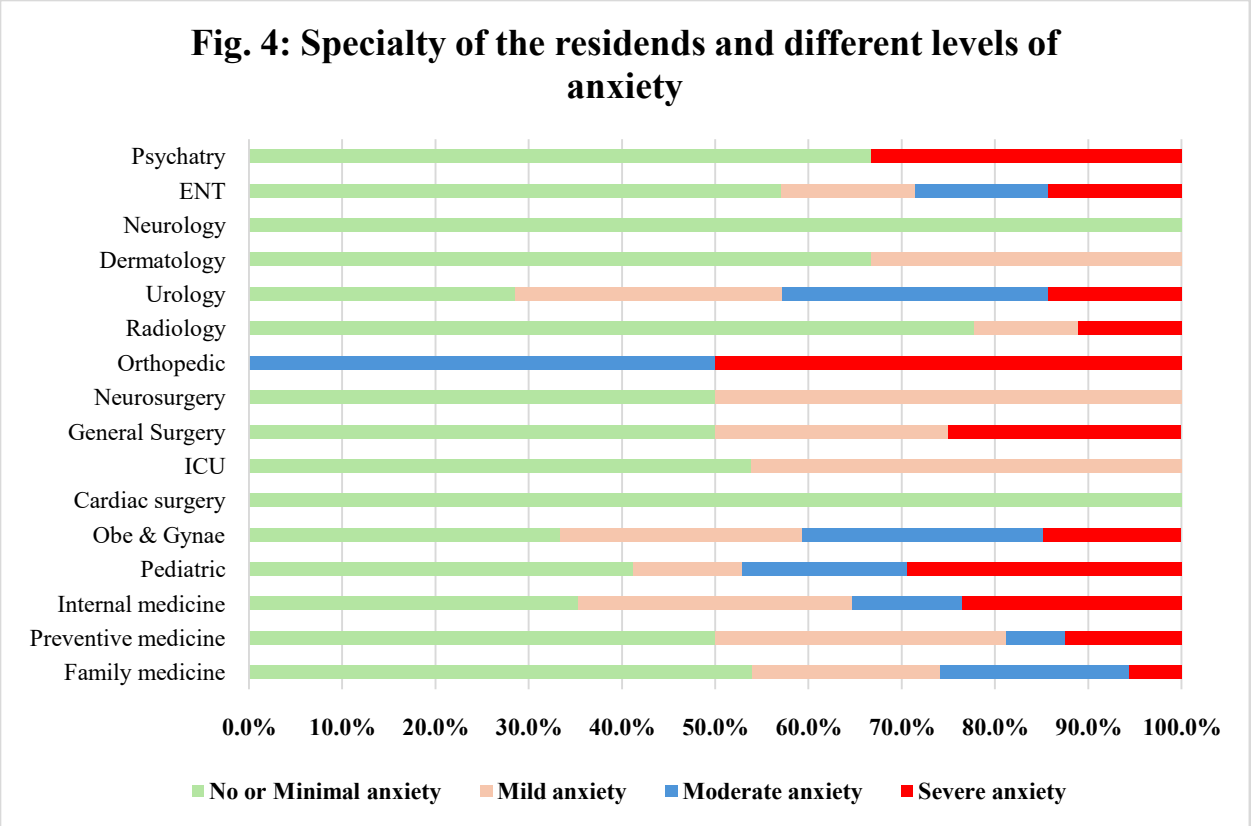

Table 6: Specialty of the residents and different levels of depression

Specialty		No or minimal anxiety	Mild anxiety	Moderate anxiety	Severe anxiety	P value
		n (%)	n (%)	n (%)	n (%)	
Specialty	Family medicine	48 (53.9%)	18 (20.2%)	18 (20.2%)	5 (5.6%)	0.653
	Preventive medicine	8 (50.0%)	5 (31.3%)	1 (6.3%)	2 (12.5%)	
	Internal medicine	6 (35.3%)	5 (29.4%)	2 (11.8%)	4 (23.5%)	
	Pediatric	7 (41.2%)	2 (11.8%)	3 (17.6%)	5 (29.4%)	
	Obe& Gynae	9 (33.3%)	7 (25.9%)	7 (25.9%)	4 (14.8%)	
	Cardiac surgery	3 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	ICU	7 (53.8%)	6 (46.2%)	0 (0.0%)	0 (0.0%)	
	General Surgery	2 (50.0%)	1 (25.0%)	0 (0.0%)	1 (25.0%)	
	Neurosurgery	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	
	Orthopedic	0 (0.0%)	0 (0.0%)	1 (50.0%)	1 (50.0%)	
	Radiology	7 (77.8%)	1 (11.1%)	0 (0.0%)	1 (11.1%)	
	Urology	2 (28.6%)	2 (28.6%)	2 (28.6%)	1 (14.3%)	

	Dermatology	2 (66.7%)	1 (33.3%)	0 (0.0%)	0 (0.0%)
	Neurology	2 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	ENT	4 (57.1%)	1 (14.3%)	1 (14.3%)	1 (14.3%)
	Psychiatry	2 (66.7%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	

Specialty of the residents and comorbidity of depression and anxiety

Orthopedics was the specialty encountered in the highest percentage of comorbidity of depression and anxiety (100%), followed by Obstetrics and Gynecology, internal medicine, and pediatrics. On the other hand, cardiac surgery showed the least comorbidity of both depression and anxiety, followed by preventive medicine [Fig. 5 & Table 7].

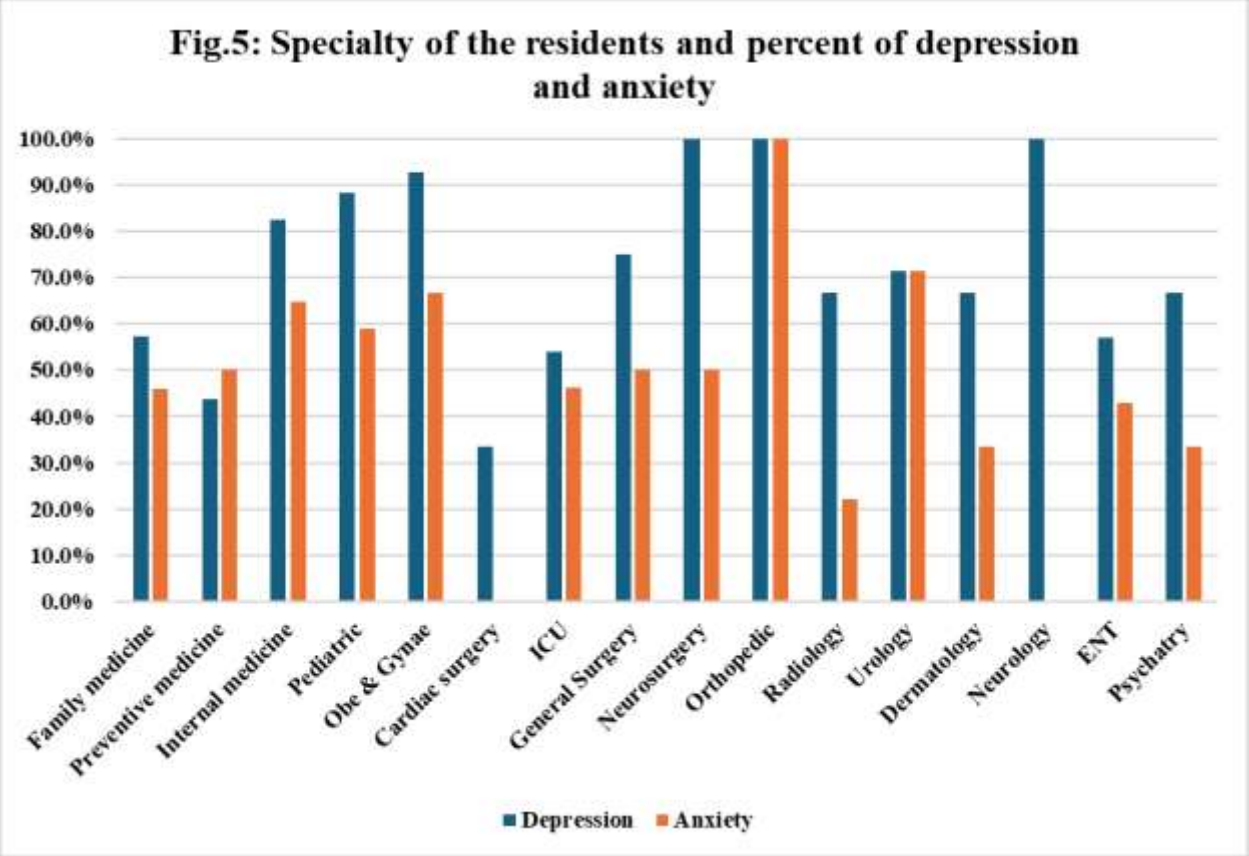

Table 7: Specialty of the residents and comorbidity of depression and anxiety

	Depression	Anxiety
Family medicine	57.3%	46.1%
Preventive medicine	43.8%	50.0%
Internal medicine	82.4%	64.7%
Pediatric	88.2%	58.8%
Obe& Gynae	92.6%	66.7%
Cardiac surgery	33.3%	0.0%
ICU	53.8%	46.2%
General Surgery	75.0%	50.0%

Neurosurgery	100.0%	50.0%
Orthopedic	100.0%	100.0%
Radiology	66.7%	22.2%
Urology	71.4%	71.4%
Dermatology	66.7%	33.3%
Neurology	100.0%	0.0%
ENT	57.1%	42.9%
Psychiatry	66.7%	33.3%

Discussion: -

In the present study, the prevalence of depression and anxiety among Saudi board residents and their possible association with predictor variables were assessed. The PHQ-9 and GAD-7 measures help detect anxiety and depression in this population, while not being diagnostic assessments. This study explored anxiety and depression levels among the Saudi board residents, highlighting the profound impact of sociodemographic characteristics, medical history, and lifestyle on mental health. A sample size of 221 participants revealed the prevalence of depression and anxiety (from mild to severe) of 67% and 50.8% respectively, significantly higher than reported by previous Saudi studies (44,45).

Sociodemographic differences in mental health

Our results indicated that female Saudi residents reported significantly higher anxiety and depression rates than their male counterparts, consistent with earlier studies (46-48). Women are more likely to experience anxiety and depression during times of stress, possibly because of the various roles they play in society, such as juggling caring and professional obligations (49,50). Furthermore, women may be more vulnerable to chronic stress due to biological processes like the impact of sex hormones on stress management (51). This contradicts the results of other research on medical students in Jeddah, which found no significant differences in depression rates between genders (52).

Our findings showed that unmarried people were more likely to experience depression and anxiety than married people. This corresponds to a previous study that used nationally representative data from approximately 541 million adults, de-identified individual-level data from seven countries: the United States, the United Kingdom, Mexico, Ireland, Korea, China, and Indonesia. The study included 106,556 cross-sectional and 20,865 longitudinal participants. The period of follow-up varied from four to eighteen years (53). The current study found that higher income and its associated satisfaction were linked to lower rates of both depression and anxiety. These results were in line with a previous study that revealed that low- income workers are more vulnerable to depression and anxiety (30).

The current study shows a significant disparity in the prevalence of depression and anxiety among inhabitants of various training centers. Moreover, more on-call duties were accompanied by more depression and anxiety. This was previously clarified as potentially referring to varying workplace support levels. (54). Moreover, workers who reported higher levels of work and interpersonal stress were more likely to experience feelings of defeat, which in turn led to an increase in depression and anxiety symptoms. This mediation effect was more pronounced for individuals with reduced levels of social support (55).
Furthermore, Poor work ability and work stress are associated with anxiety and depression in healthcare professionals (56).

Residents' specialty and variation in mental health

The current study showed an apparent disparity in the prevalence of depression and anxiety among inhabitants of various training specialties. The highest risk was in orthopedic, neurosurgery, and Obstetrics & Gynecology specialties, and the lowest was in cardiac surgery and preventive medicine. These results were in line with a previous study that found that about 30% of Saudi surgeons suffer from comorbidity of depression and anxiety (43). The high risk of comorbidity of depression and anxiety among orthopedic residents was previously observed in a systematic review, which mentioned that Depression and anxiety both were highly prevalent among orthopedic

medical residents, with highly significant levels of psychological distress affecting approximately one-third of this population (57). Globally, depending on the tool used, the prevalence of depression or depressed symptoms among resident physicians ranged from 20.9% to 43.2%, with the overall estimate rising with each passing year (29). Moreover, Anxiety was assessed to be 17% and depression to be 45% during COVID-19, the highest rates of depression in pediatrics, internal medicine, and anesthesiology. Pediatrics and internal medicine have the highest levels of anxiety (58).

Lifestyle and medical history differences in mental health

The present work revealed that regular exercise, at least for 150 minutes per week, was accompanied by a lower rate of depression and anxiety among the participants. The same findings were observed by Martin- Del-Campo et al. (2023), who found that moderate physical activity has an association with a lower level of depression, anxiety, and stress in healthcare workers during the COVID-19 pandemic. (59). Also, other research found that healthcare workers' mental health can be enhanced by working out at home using a variety of fitness applications and little to no equipment. To assess interest, adoption, adherence, and the mental, physical, and financial impacts of the suite of applications, larger efficacy trials are required, in which all healthcare workers from an organization are given more opportunity to use them. This may be due to the promotion of brain-derived neurotrophic factors (BDNF), which support brain health, or endorphin release, which improves mood and reduces pain perception, or stress hormone regulation, which reduces the cortisol levels (60). Moreover, one of the leading causes of depression is a sedentary lifestyle and inactivity. Sport and physical activity provide a potential, evidence-based approach for preventing and treating depression because of their widespread accessibility, substantial and clinically meaningful benefits, and near-complete lack of side effects. (61).

The current study elucidated that smoking among the participants has no role in minimizing the rate of depression or anxiety. This contradicts the results of other research, which found that the correlation between mental illness and smoking is evident, as individuals with mental health conditions exhibit both increased prevalence and greater intensity of smoking behaviors (62).

The present study concluded that healthcare workers with a pre-existing history of chronic or psychiatric disease had more than double the risk of depression and anxiety. The same results were recorded by a prospective cohort study of nurses (2020–2022) in China, which reported that a history of diabetes and hypertension significantly increased anxiety and depressive symptoms (63). Previous research observed that chronic illnesses strongly influence anxiety and depression prevalence. Increasing the prevalence of these mental health conditions is linked to cardiovascular disease, COPD, cancer, neurological disorders, including multiple sclerosis and Parkinson's, and chronic pain conditions like fibromyalgia and arthritis (64). Additionally, the trend we observed, which indicated that females diagnosed with psychological disorders had a higher prevalence of depression than males, is consistent with previous research that suggests that a history of psychiatric disorders substantially influences the prevalence of depression (65).

Conclusion: -

Although depression and anxiety are prevalent in healthcare professionals, they are also commonplace in residents. Orthopedics was the specialty encountered in the highest percentage of comorbidity of depression and anxiety, followed by Obstetrics and Gynecology, internal medicine, and pediatrics. These conditions are frequently called "invisible diseases" due to their challenging identification and diagnosis. A significant determinant of anxiety in this study was gender, as females consistently exhibited a higher prevalence of anxiety than their male counterparts. The levels of anxiety and depression in this study were associated with the lifestyle factors and health-related concerns, particularly the history of chronic diseases and psychiatric disorders. To enhance the mental health of inhabitants, it is necessary to provide continuous management and global attention, as mental disorders are preventable in the workplace. Health professionals should support increasing physical activity to improve mental health, and interventions should encourage and maintain its use. Patients with various chronic conditions need to have their mental health addressed. Improving the mental health of training residents and providing new interventions to prevent, recognize, and manage comorbidity of depression and anxiety in our clinical and community settings, especially in high-risk specialties, will ensure optimal patient care and improve work productivity. Additional longitudinal and clinical investigations are required to address the current investigation's constraints.

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