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Association of depression and anxiety with ischemic heart diseases among adults in Riyadh, Saudi Arabia 2022

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ABSTRACT

Background: Depression is a serious mental disorder that can negatively impact the daily function of many individuals. Many chronic disorders and physiological imbalances can be the result of psychiatric illnesses and vice versa. Our aim of this study is to determine the relationship between Psychological Disorders and Ischemic heart diseases among adults in Saudi Arabia in 2022. *Methods:* A cross-sectional study. The target population was adults 18 years old and over and the sample size of 304 adults. The data were collected between April 2022 and June 2022 in Riyadh, KSA. Questionnaires were distributed to participants who meet the criteria to determine the relationship between psychological disorders and ischemic heart diseases. The Hospital Anxiety and Depression Scale was used in both Arabic and English. The data was cleared, coded and entered through SPSS software. *Results:* Of 304 participants, only 5 were previously diagnosed with ischemic heart disease (IHD). 1% of those participants had abnormal results in the HADS anxiety section. (P=0.16) Furthermore, in the depression section of the HADS, 0.7% had abnormal results. (P=0.14) None of the participants with an IHD diagnosis had borderline abnormal results in either section of the HADS. *Conclusion:* The number of participants who were previously diagnosed with ischemic heart disease was limited. Despite that, an association between psychological disorders including anxiety and depression with ischemic heart disease was found using the HADS. Further and larger studies are required to establish a clearer relationship.

Keywords: Anxiety, Depression, Ischemic heart disease.

1. INTRODUCTION

Depression and anxiety disorders are (serious) mental illnesses that can significantly effect a patient's life. Moreover, the most common mental disorders appear to be anxiety disorders (Kessler, 1994). Chronic diseases are any condition that lasts for three months or longer. According to previous

studies, several chronic conditions have been linked to psychological disorders, these include cardiovascular diseases, osteoporosis, diabetes mellitus, asthma and distinct types of cancers (Clarke, 2009), these conditions have particularly been linked to depression and anxiety. Thus, mental disorders are a major contributor to the development of chronic diseases and vice versa. In addition, the incidence of coronary heart disease (CHD) has been predicted by a previous diagnosis of generalized anxiety (Barger, 2005). According to King Salman Center for Disability Research, mental disorders are on the rise in Saudi Arabia. It reports that during their lifetime, 34.2% of Saudi citizens will suffer from a mental disorder, 40% of Saudi adults aged 25 to 34 have been diagnosed with a mental disorder and only 13.6 of them seek help (National Mental Health Survey, 2019).

A study of 340 Saudi adults found that 72.9% suffered from depression (Abumadini, 2019). In a separate study conducted in 1995-2000, the prevalence of hypertension among Saudi Arabian adults aged 30-70 was 26.1% (Al-Nozha, 2007). However, in a more recent study conducted in 2022, the incidence of elevated blood pressure among Saudi Arabian adults was 55%-65% (Yagoub, 2022) Moreover, the incidence of diabetes has increased over the past 25 years (Alotaibi, 2017). As the incidence of mental disorders increased, so did the incidence of hypertension and diabetes. This study will investigate both the general and specific relationships between several psychological disorders and chronic diseases. Moreover, it may potentially aid in future studies focused on the screening and prevention of psychosomatic disorders. We aim to determine the relationship between Psychological Disorders and Ischemic heart diseases among adults in Saudi Arabia 2022.

2. METHODS

This study is a cross-sectional study. The target population was adults 18 years old and over, with a sample size of 304 adults. Data were collected between April 2022 and June of 2022 in Riyadh, KSA. Both physical and online copies of the questionnaire were distributed to eligible participants to assess the relationship between psychological disorders and ischemic heart disease. We used the Hospital Anxiety Depression Scale (HADS) in both Arabic and English languages. The (HADS) is a reliable questionnaire used to identify signs and symptoms of depression and anxiety. Our own questionnaire contains three parts, the first part is about demographic data, the second part contains the HADS scale and the third part is about possible previous diagnosis of ischemic heart disease to determine its association with their psychological state.

The data will be cleared, coded and entered through the Statistical Package for the Social Sciences (SPSS). The results are presented in the form of percentages and frequencies in tables. Appropriate statistical tests of significance were used to analyze the data. A p-value of < 0.05 is considered significant. Permission was obtained from the participants and the participants were assured that the data in this study would be used for scientific purposes only, while maintaining the confidentiality of their identity and their responses. They were also informed that they were free to withdraw at any time and that their participation was entirely voluntary.

3. RESULTS

When looking at table 1, it was found that 172 participants of the study were between the ages of 18 and 28, 95 were between 29-39, 25 between 40-50 and 12 participants were 50 years and above. More than half of the participants were females and the other 45% were males. 48.7% of the participants have a higher education, 37.5% have high school education, while only 0.3% were uneducated. 41.4% of the participants have an income of 3000 riyals or less, 37.2% between 5000-10000 riyals and 21.4% have an income of 20000 riyals and above.

Table 1 Personal Data

Age	Frequency	Percent
18-28	172	56.6
29-39	95	31.3
40-50	25	8.2
50 and more	12	3.9
Total	304	100.0
Gender	Frequency	Percent
Male	138	45.4
Female	166	54.6
Total	304	100.0

Education Level	Frequency	Percent
Not educated	1	0.3
Middle school	41	13.5
High school	114	37.5
Higher education	148	48.7
Total	304	100.0
Monthly Income	Frequency	Percent
3000 or less	126	41.4
5000-10000	113	37.2
20000 or more	65	21.4
Total	304	100.0

(Source: Marwa et al., 2022) N=304

Table 2 Prevalence of Ischemic heart diseases

Diagnosed with IHD	Frequency	Percent
Yes	5	1.6
No	299	98.4
Total	304	100.0

N=304

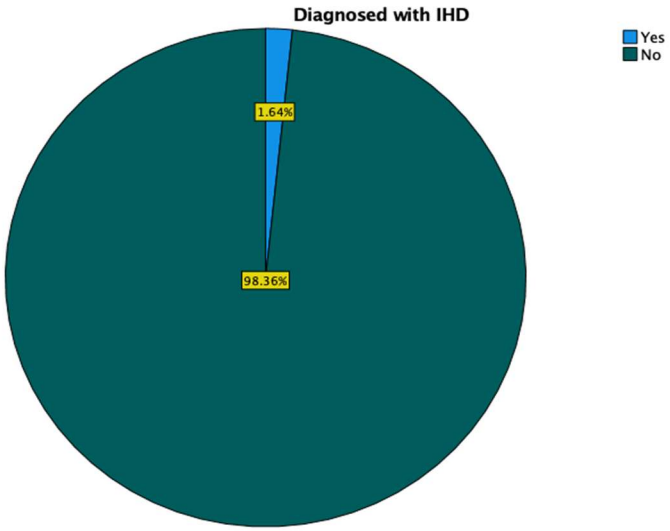

Figure 1 Prevalence of Ischemic heart diseases

Out of 304 participants in table 2, figure 1, it was found that only 5 (1.6%) were previously diagnosed with Ischemic Heart Disease.

Table 3 Severity of Depression and Anxiety

Severity of Anxiety	Frequency	Percent
Normal	155	51.0
Borderline abnormal	64	21.1
Abnormal	85	28.0
Total	304	100.0
Severity of Depression	Frequency	Percent
Normal	193	63.5
Borderline abnormal	68	22.4
Abnormal	43	14.1
Total	304	100.0

(Source: Marwa et al., 2022) N=304

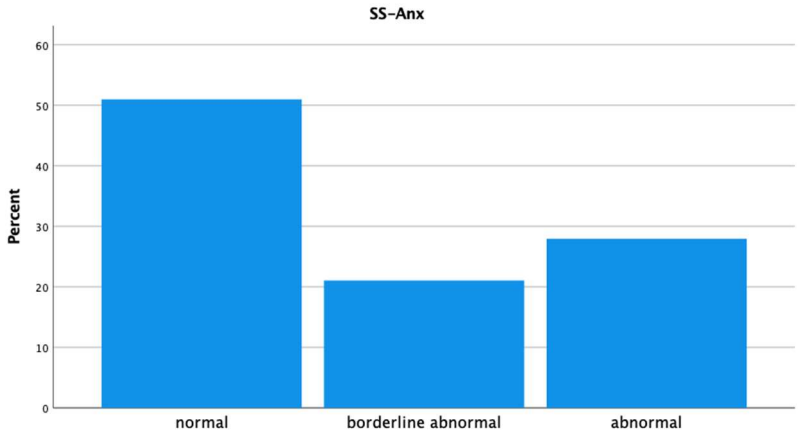

Figure 2 Severity of Anxiety (Source: Marwa et al., 2022)

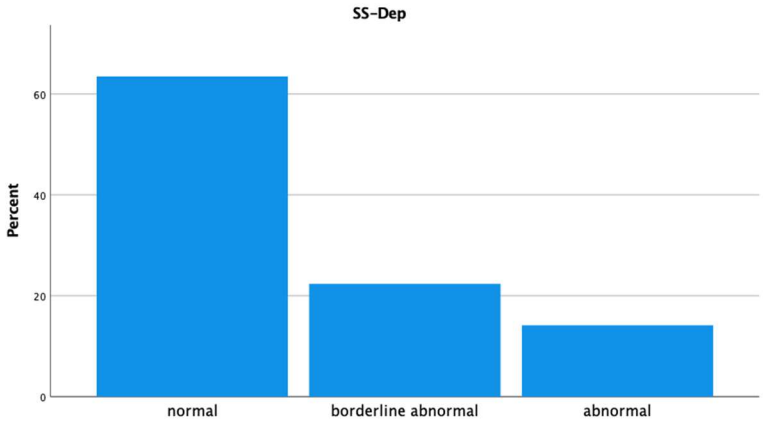

Figure 3 Severity of Depression (Source: Marwa et al., 2022)

In table 3, figure 2, 3 it was found that half of the participants had normal results in the HADS anxiety section, while 28% had abnormal results. In the depression section of the HADS, 64% of the participants had normal results and 14.1% had abnormal results.

Table 4 Correlation between Age and Severity of Anxiety and Depression

		Anxiety			
		Normal	Borderline abnormal	Abnormal	Total
Age	18-28	80	36	56	172
		26.3%	11.8%	18.4%	56.6%
	29-39	54	20	21	95
		17.8%	6.6%	6.9%	31.3%
	40-50	15	7	3	25
		4.9%	2.3%	1.0%	8.2%
	50 and more	6	1	5	12
		2.0%	0.3%	1.6%	3.9%
	Total	155	64	85	304
		51.0%	21.1%	28.0%	100.0%
		Depression			
		Normal	Borderline abnormal	Abnormal	Total
	18-28	106	42	24	172

Age		34.9%	13.8%	7.9%	56.6%
	29-39	63	20	12	95
		20.7%	6.6%	3.9%	31.3%
	40-50	16	5	4	25
		5.3%	1.6%	1.3%	8.2%
	50 and more	8	1	3	12
		2.6%	0.3%	1.0%	3.9%
	Total	193	68	43	304
		63.5%	22.4%	14.1%	100.0%

(Source: Marwa et al., 2022) P value of Anxiety=0.14 P value of Depression=0.79

Of the 28% of the participants who had abnormal results in the anxiety section, 18.4% were between the ages of 18-28 years, about 7% were between the age of 29-39 years, around 2% were 50 years or above and only 1% were between 40-50 years. This variation was found to be statistically significant (p=0.14). About one quarter of the participants had abnormal results in the depression section. 7.9% were between 18-28 years, 3.9% were between 29-39 years, 13% were between 40-50 years and only 1% were 50 years or above. (p=0.79).

Table 5 Correlation between Gender and Severity of Anxiety and Depression

		Anxiety			
		Normal	Borderline abnormal	Abnormal	Total
Gender	Male	78	29	31	138
		25.7%	9.5%	10.2%	45.4%
	Female	77	35	54	166
		25.3%	11.5%	17.8%	54.6%
	Total	155	64	85	304
		51.0%	21.1%	28.0%	100.0%
		Depression			
		Normal	Borderline abnormal	Abnormal	Total
Gender	Male	87	31	20	138
		28.6%	10.2%	6.6%	45.4%
	Female	106	37	23	166
		34.9%	12.2%	7.6%	54.6%
	Total	193	68	43	304
		63.5%	22.4%	14.1%	100.0%

(Source: Marwa et al., 2022) P value of Anxiety=0.11 P value of Depression=0.98

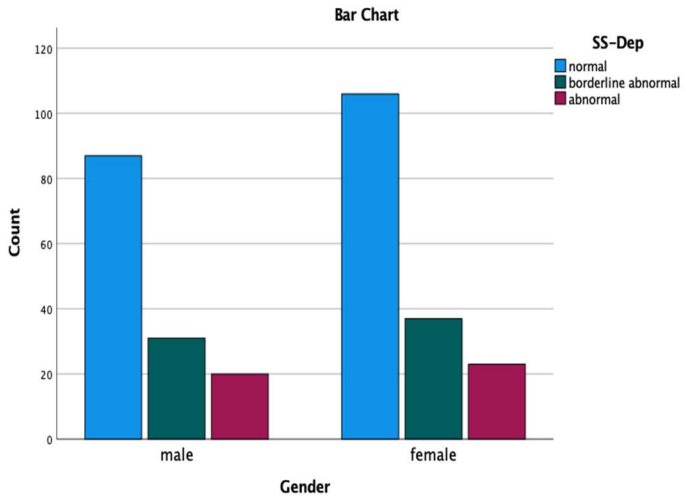

Figure 4 Correlation between Gender and Severity of Anxiety and Depression (Source: Marwa et al., 2022)

Out of 85 participants who had abnormal anxiety results, 10.2% were males and around 18% were females. (p=0.11). 14.1% of participants had abnormal results in the depression section of the HADS, 6.6% were males and 7.6% were females. This variation was found to be statistically significant (p=0.98).

Table 6 Correlation between Education Level and Severity of Anxiety and Depression

		Anxiety			
		normal	borderline abnormal	abnormal	Total
Education Level	not educated	0	0	1	1
		0.0%	0.0%	0.3%	0.3%
	middle school	21	8	12	41
		6.9%	2.6%	3.9%	13.5%
	high school	58	21	35	114
		19.1%	6.9%	11.5%	37.5%
	higher education	76	35	37	148
		25.0%	11.5%	12.2%	48.7%
	Total	155	64	85	304
		51.0%	21.1%	28.0%	100.0%
		Depression			
		normal	borderline abnormal	abnormal	Total
Education Level	not educated	0	0	1	1
		0.0%	0.0%	0.3%	0.3%
	middle school	24	10	7	41
		7.9%	3.3%	2.3%	13.5%
	high school	71	29	14	114
		23.4%	9.5%	4.6%	37.5%
	higher education	98	29	21	148
		32.2%	9.5%	6.9%	48.7%
	Total	193	68	43	304
		63.5%	22.4%	14.1%	100.0%

(Source: Marwa et al., 2022) P value of Anxiety=0.64 P value of Depression=0.43

When looking at table 6, it was found that out of 28% of those who suffer from anxiety, 12.2% have higher education, about 12% have high-school education, 2.3% have middle-school education and only 0.3% were uneducated. This statistical significance is (p=0.64). Furthermore, out of 14.1% of those whose results in the depression section were abnormal, 7% have higher education, around 5% have high-school education, 2.3% have middle-school education and only 0.3% were uneducated. The statistical significance of depression was found to be (p=0.43).

Table 7 Correlation between Monthly Income and Severity of Anxiety and Depression

		Anxiety			
		Normal	Borderline abnormal	Abnormal	Total
Monthly Income	3000 or less	57	26	43	126
		18.8%	8.6%	14.1%	41.4%
	5000-10000	64	22	27	113
		21.1%	7.2%	8.9%	37.2%
	20000 or more	34	16	15	65
		11.2%	5.3%	4.9%	21.4%
	Total	155	64	85	304
		51.0%	21.1%	28.0%	100.0%
		Depression			
		Normal	Borderline abnormal	Abnormal	Total
Monthly Income	3000 or less	78	30	18	126
		25.7%	9.9%	5.9%	41.4%
	5000-10000	71	25	17	113

		23.4%	8.2%	5.6%	37.2%
	20000 or more	44	13	8	65
		14.5%	4.3%	2.6%	21.4%
	Total	193	68	43	304
		63.5%	22.4%	14.1%	100.0%

(Source: Marwa et al., 2022) P value of Anxiety=0.29 P value of Depression=0.94

Out of 85 participants with abnormal anxiety results, 14% have a monthly income of 3000 riyals or less, about 9% have between 5000-10000 riyals and 5% have 20000 riyals or more. This variation was found to be statistically significant (p=0.64). Moreover, out of 14.1% of those with abnormal results in the depression section of the HADS, 6% have a monthly income of 3000 riyals or less, 5.6% have between 5000-10000 riyals and 2.6% have an income of 20000 riyals or more. The statistical significance is (p=0.43).

Table 8 Correlation between Ischemic Heart Disease and Severity of Anxiety

		Anxiety			
		Normal	Borderline abnormal	Abnormal	Total
Diagnosed with IHD	Yes	2	0	3	5
		0.7%	0.0%	1.0%	1.6%
	No	153	64	82	299
		50.3%	21.1%	27.0%	98.4%
	Total	155	64	85	304
		51.0%	21.1%	28.0%	100.0%

P value of Anxiety=0.16

When looking at table 8, it was found that around 1% out of 28% are suffering from both anxiety and Ischemic Heart Disease. This variation was found to be statistically significant (p=0.16).

Table 9 Correlation between Ischemic Heart Disease and Severity of Depression

		Depression			
		Normal	Borderline abnormal	Abnormal	Total
Diagnosed with IHD	Yes	3	0	2	5
		1.0%	0.0%	0.7%	1.6%
	No	190	68	41	299
		62.5%	22.4%	13.5%	98.4%
	Total	193	68	43	304
		63.5%	22.4%	14.1%	100.0%

P value of Depression=0.14

When looking at table 9, it was found that around 1% out of 14.1% have a previous diagnosis of ischemic heart disease and have abnormal scores in the depression section of the HADS (p=0.14).

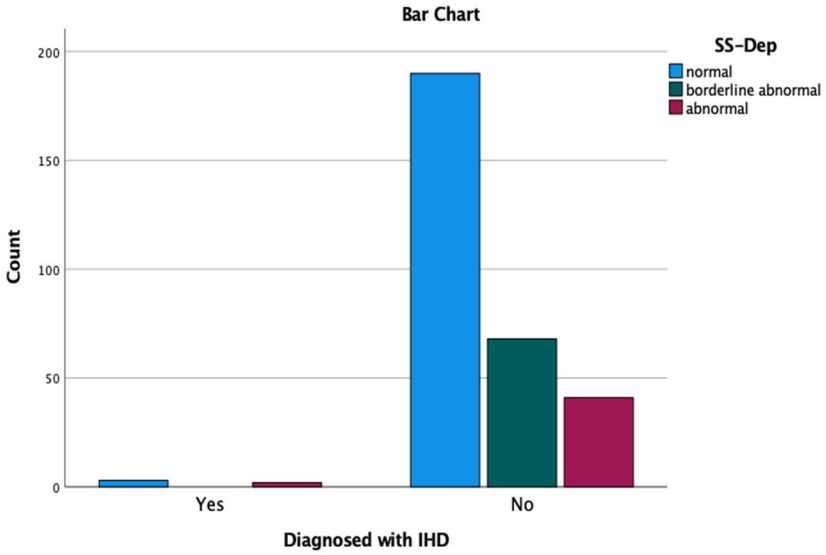

Figure 5 Correlation between Ischemic Heart Disease and Severity of Depression

4. DISCUSSION

Depression is a major public health problem and has an especially large effect on health when comorbid with a chronic medical condition. Also, it is a highly prevalent risk factor for incident of and is associated with morbidity and mortality of cardiovascular disease (Zhang, 2018). The association of depression, anxiety and ischemic heart diseases comorbidities has been described in few epidemiological studies. The results indicate that the relationship between psychological disorders including anxiety and depression was insignificant, with only 0.7-1% of the whole sample. Our study showed that the higher incidence of having either anxiety or depression is at ages between 18-28 years.

Similarly, in previous studies, it was seen that patients with generalized anxiety disorder or depression had a mean age of 23 years. Another study showed that Mean age of the present sample was 41.8 years. Also, in the same study we found that only 5.6% out of the whole sample had CVD, which same what we found in our study (Vogelzangs, 2010). Moreover, previous studies showed that the level of anxiety was significantly associated with sex of the respondents where females had more anxiety cases than males (Sharma, 2018), which is also demonstrated by the results of our study. Out of 304 participants, it was found that only 5 (1.6%) were previously diagnosed with Ischemic Heart Disease whereas studies conducted in Nepal showed that out of 168 respondents, two-thirds (66.1%) of the respondents were diagnosed with myocardial infraction followed by angina pectoris (20.2%) and ischemic heart failure (13.7%) (Sharma, 2018). Moreover, family income and occupation status were also not associated with level of anxiety patients. Similarly, study conducted in Pakistan showed that there was no significant relation of anxiety with socioeconomic and occupation status of CAD patients (Khan, 2016).

Furthermore, a study in Australia showed that Affective and anxiety disorders were more common among people with physical conditions than among people without chronic physical conditions (Teesson, 2011). In contrast to our study where we only focused on IHD related to anxiety and depression we found no great relationship between the chronic diseases and the anxiety disorders, but depression increases the risk of heart disease, while the association with anxiety was less clear. These disorders can have an impact on the adherence of patients to medical treatments and advice which in turn affects their quality of life. A special study in France used the HADS to assess the psychological state of patients with cardiovascular diseases and we used the same scale in our study (Bambauer, 2005). Our hypothesis was that ischemic heart diseases, as well as other chronic diseases and physiological imbalances, can be a result of various psychiatric disorders. Thus, the early detection and treatment of psychological disorders could prevent the likelihood of these changes escalating into a chronic longstanding illness. There are no major limitations that were found.

5. CONCLUSION

This study found that there is an association between anxiety, depression and heart disease, which may represent a greater danger to the patient. These psychological disorders can affect the treatment of heart disease and other chronic diseases. Awareness and education of the patients and the general public are crucial for understanding the seriousness of the situation and avoiding future complications.

Ethical Considerations

The ethical approval of the IRB (IRB07-03082022-58) in Almaarefa University, College of Medicine was fulfilled before the start of the data collection. The aim of this study was clarified to the participants of this study and the data was kept confidential.

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Authors contribution

All authors had substantial contribution to the paper, ESA and GNA and LAA and ABH and DHA designed the study and prepared the proposal. ABH and HTZ analyzed and interpreted data. ESA wrote results and discussion. DHA checked the paper from plagiarism and did proof reading. KIM checked and revised every step of this paper. All authors critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Informed consent

Not applicable.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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