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The Assessment of the Prevalence of Depression among Cardiovascular Patients at Dil Chora Referral Hospital, Dire Dawa, Ethiopia

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Abstract

This study aimed to examine the prevalence of depression among cardiovascular patients at Dil Chora referral hospital. This research uses a cross-sectional design &available sampling technique, 370 patients with CVD were taken. Data were collected using pretested standardized scales. Data analyses were conducted using SPSS version 20. Particularly, Mean, Standard Deviation, t-test, and one-way ANOVA. Results showed that the majority (39.84%) of respondents had mild level depression. There are statistically significant mean differences in the level of depression (t (398) =14.79, p <0.05) between male and female cardio vascular patients. Moreover, results showed the presence of significant mean differences in the level of depression (F (3, 366) =303, p<0.05) among respondents of the study across age groups. There are significant mean differences in the level of depression (F (3, 366) =261, p<0.05) among respondents across the educational status. There are also significant mean differences in the level of depression (F (2, 367) =638.58, p<0.05) among respondents across the marital status.

Keywords: *Depression, Cardio Vascular Disease, Dire Dawa*

1. Introduction

Cardiovascular disease (CVD) stands as a significant global health concern, involving conditions affecting the heart or blood vessels and representing a leading cause of mortality and disability worldwide (WHO, 2010). According to the World Health Organization Report (2010), 17.9 million deaths were attributed to CVD, accounting for 29.2% of total global fatalities. Studies by Modabber (2012) have highlighted a substantial prevalence of depression, ranging from 20% to 35%, among populations with cardiovascular disease on a global scale. Moreover, research has shown that depression serves as a predictor of cardiovascular disease and adverse outcomes in patients with existing cardiac conditions (Dhar & Barton, 2016; Mebratu, Abebaw & Getinet, 2016). Given that cardiac diseases are classified as psychosomatic disorders, psychological factors play a critical role in their onset and progression, either directly or indirectly (Modabber, 2013).

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In Ethiopia, cardiovascular disease ranks as the leading non-communicable disease in terms of mortality and disability, with an annual death rate due to Non-communicable Diseases (NCDs) reaching 34% according to WHO (2008). A study conducted at Menlik II referral hospital revealed a 32% prevalence of depression among cardiac patients, emphasizing significant associations with factors such as stressful life events, gender, literacy level, and social support (Mebratu, Abebaw & Getinet, 2016).

Despite these findings, limited attention has been directed towards the co-occurrence of cardiovascular disease and depression in Ethiopia. Notably, studies investigating mental health issues like depression among cardiovascular patients are scarce relative to the disease's prevalence in the country. This research gap motivates the current study, particularly considering the high prevalence of cardiovascular disease at Dil Chora hospital, where numerous patients seek treatment.

The purpose of this study is to examine the prevalence of depression and anxiety among patients with cardiovascular disease at Dil Chora Referral Hospital in Dire Dawa, Ethiopia. The specific objectives include determining the prevalence of depression and anxiety among these patients and investigating the potential differences in depression levels based on socio-demographic variables such as sex, age, educational status, and marital status. To this end the following basic questions were raised

1. What is the prevalence of depression among patients with cardiovascular disease at Dil Chora Referral Hospital?
2. How common is anxiety among patients with cardiovascular disease at Dil Chora Referral Hospital?
3. Are there significant differences in depression levels based on socio-demographic factors among patients with cardiovascular disease at Dil Chora Referral Hospital?

2. Methods and Materials

This study utilized a cross-sectional study design to investigate depression among cardiovascular patients at Dil Chora Referral Hospital in Dire Dawa. The research was conducted at Dil Chora Referral Hospital in the Dire Dawa administration, located 515 km from Addis Ababa. Dire Dawa city houses 6 hospitals (2 Governmental and 4 Private Hospitals), 13 health centers, and 36 health posts. The two public general Hospitals, Dil

Chora and Sabian General Hospitals, serve as major referral centers for nearby health facilities in Dire Dawa and neighboring regions.

The study included all cardiovascular disease patients receiving treatment at Dil Chora Referral Hospital from April to May 2019, totaling 6700 individuals (male=3750, female=2950). Convenience sampling was used to select eligible patients available during the study period until the required sample size of 388 was met. The sample size was determined using the sampling size determination formula developed by Yamanes (1967), with a precision level of ±5. $n = \frac{N}{1+N(e^2)}$, Where *N*= the total number of target population, n = the required sample size, e= maximum variability or margin of error 5% (0.05). Thus, N= 4,900 e= 0.05. $n = \frac{6700}{1+6700(0.05)2} = \frac{6700}{1+6700(0.0025)} = \frac{6700}{17.25} = 388$

Inclusion criteria involved CVD patients aged 18 and above who volunteered to participate, while seriously ill or communication-impaired patients were excluded. Data collection involved two pre-established standardized scales, including the Beck Depression Inventory (BDI-II). The Beck Depression Inventory–II (BDI-II) is a 21-item self-report depression screening measure. Each item is rated on a 4-point Likert-type scale ranging from 0 to 3, with higher scores indicating higher levels of depression. The maximum total score for all 21 items is 63. According to the BDI-II manual, scores of 0 to 13 denote minimal depression, scores of 14 to 19 denote mild depression, scores of 20 to 28 denote moderate depression, and scores of 29 to 63 denote severe depression. BDI-II is designed for use among individuals 13 years old and above. The psychometric properties of the Beck Depression Inventory–II (BDI-II) as a self-administered screening tool for depressive symptoms were examined in a sample of community-dwelling older and younger adults. Internal reliability of the BDI-II was found to be good among older and younger adults. Jefferson, Powers, and Pope (2000), using a sample of 640 older and younger women recruited from independent living facilities, reported that the BDI-II had good internal consistency ($\alpha = .92$). The pilot test results from 55 CVD patients indicated a Cronbach's Alpha (α) value of 0.84 for BDI-II, ensuring good internal reliability.

Data analysis was performed using SPSS version 20, utilizing descriptive statistics (Frequency, Mean, and Standard Deviation) to assess the prevalence of outcome variables. Independent samples t-test and one-way ANOVA were utilized to examine differences in depressive symptoms among CVD patients based on socio-demographic variables. Ethical considerations were paramount, with permission obtained from Dil Chora Referral Hospital

officials to collect data. Patients provided written consent after being briefed on the study's purpose. Confidentiality was maintained by not recording personal information, and participants were informed of their right to withdraw from the study at any time.

3. Results

This section presents results of the study. The result section classified in to three major sections. The first section presents the socio-demographic data of respondents of the study. Sex, age, educational status and marital status were treated as the socio-demographic features of respondents. Section two deals with results related with the prevalence of depression among patients with cardio vascular disease in the study area. Section three focuses on results on the level of depressive symptoms across socio-demographic variables.

3.1. Socio-Demographic Characteristics of Respondents

Sex, age, educational and marital status were considered as the socio-demographic features of respondents of the study. In this section, each characteristic has been summarized using frequency and percentage hereunder.

Table 1: Socio-Demographic Characteristics of Respondents

No	Characteristics	**Frequency**	**Percentage**
	Sex		
	Male	201	52.34
	female	183	47.65
	Total	384	100
	Age		
	20-35 years	37	9.6
	36-46 years	109	28.38
	47-60 years	145	37.36
	Above 60 years	93	24.2
	Total	384	100
	Educational Status		
	Illiterate	97	25.26
	Primary level	102	26.56
	Secondary level	92	23.95
	College diploma & above	93	24.21
	Total	384	100
	Marital Status		
	Single	81	21.09
	Married	207	53.9
	Divorced	95	24.73
	Total	384	100

Table 1 illustrates the socio-demographic profile of respondents of the study. As shown in table, 201(52.34%) of the respondents were male; whereas, 183(47.65%) were female by their sex. in relation to their age, 37(9.6%) of the total respondents were in the age range of 20-35 years, 109(28.38%) of the respondents were in the age range of 36-46, 145(37.36%) were in the age range of 47-60 years and 94(24.2%) of the respondents were above the age of 60 years. With respect to the educational level of respondents, those respondents who were illiterate account for 97(25.26%), 102(26.56%) completed primary level, 92(23.95%) complemented secondary level and 93(24.21%) of the respondents had college diploma and above. Concerning marital status, 81(21.09%) of the respondents were unmarried, 207(57.9%) respondents on the other hand, were married. Finally, 95(24.73%) of the respondents were divorced.

3.1. The Prevalence of Depression among Patients with Cardio Vascular Disease

This study examined the prevalence of depression results as measured by Beck Depression Inventory (BDI-II). Accordingly, respondents who score from 0-13 are supposed to have minimal depression, 14-19 leveled as having mild depression, 20-28 have moderate depression and those who score 29-63 are leveled to have server depression.

Table 2: Prevalence of Depression among Cardio Vascular Patients

Variable	Frequency	Percentage (%)
Depression		
(0-13) Minimal Depression	105	23.74
(14-19) Mild Depression	153	39.84
(20-28) Moderate Depression	95	24.73
(29-63) Severe Depression	80	20.83
	384	100

In Table 2, it is observed that 105 (23.74%) of the study participants had depression scores between 0-13, indicating minimal depression. 153 (39.84%) of the participants scored between 14-19, signifying mild depression. The majority of respondents, 95 (24.73%), obtained scores ranging from 20-28, indicating a moderate level of depression. Additionally, 80 (20.83%) of the respondents scored between 29-63, indicating severe depression.

The prevalence of Depression among Patients with Cardio Vascular Disease across Socio-Demographic Variables

As previously mentioned, one of the study objectives was to evaluate the level of depression among respondents based on their socio-demographic characteristics. Sex, age, educational level, and marital status were regarded as the socio-demographic attributes of the study participants. Consequently, independent samples t-tests and one-way ANOVA were conducted to examine whether there were statistically significant mean differences across the different groups. Independent samples t-tests were performed for sex (male and female), while one-way ANOVA was conducted for age, educational level, and marital status. The following tables present these results.

Table 4: Independents samples t-test among cardio vascular patients by sex

Variables	Male(n=201)		Female(n=183)				
	M	SD	M	SD	t-value	df	Sig.
Depression	15.1	6.4	28	7.8	18.67	398	0.005

p<0.01; M=Mean; SD=Standard Deviation

Table 4 presents a summary of the results from the independent samples t-test conducted among CVD patients based on their sex. The table reveals a notable mean difference (t (398) = 14.79, p < 0.01) in the reported levels of depression between male and female cardiovascular patients. Particularly noteworthy is the observation that the mean depression scores for females (M=28, SD=7.8) were higher than those for males (M=15.1, SD=6.4).

Table 5: Means, Standard deviations and One-way ANOVA on Depression and Anxiety across Age

Variables	20-35 (n=37)		36-46 (n=109)		47-60 (n=145)		>60 (n=93)			
	M	SD	M	SD	M	SD	M	SD	F	Sig.
Depression	8.9	5.2	10.3	3.5	24.5	1.8	31.4	9.1	303.74	0.004**

p<0.01; M=mean; SD=standard deviation, CI= confidence interval

In Table 5, the one-way ANOVA results demonstrate significant mean differences in the level of depression (F (3, 366) = 303.74, p < 0.01) among the study participants across different age groups. Specifically, Tukey's post hoc analysis reveals that respondents in the 20-35 age group did not show a significant difference compared to those in the 36-46 age

group. However, respondents in the 20-35 age group differed significantly from those in the 47-60 age group and the group above 60 years. Similarly, participants in the 36-46 age group exhibited significant differences compared to those in the 47-60 age group and the group above 60 years.

Table 6: Means, Standard deviations and One-way ANOVA on Depression and Anxiety across Educational Level

Variables	Illiterate (n=97)		Primary (n=102)		Secondary (n=92)		Diploma & above (n=93)			
	M	SD	M	SD	M	SD	M	SD	F	Sig.
Depression	31.2	9.7	26.6	1.8	17.5	1.8	10.4	5.7	261.31	.024

*p<0.05;**p<0.01 M=mean; SD=standard deviation, CI= confidence interval*

The results from the one-way ANOVA revealed significant mean differences ($F(3, 366) = 261.31$, $p < 0.05$) in the level of depression among respondents based on their educational status. Upon closer examination of the mean scores across the educational categories, respondents who were illiterate or had completed only primary education exhibited higher mean scores compared to those with secondary, college diploma, and higher educational levels.

Furthermore, the Tukey's post hoc analysis indicated that illiterate respondents showed significant differences compared to those with secondary education and college diploma or higher. Similarly, respondents with primary education level demonstrated significant differences from those with secondary education and college diploma or higher educational statuses.

Table 7: Means, Standard deviations and One-way ANOVA on Depression and Anxiety across Marital Status

Variables	Single (n=81)		Married (n=207)		Divorced (n=95)			
	M	SD	M	SD	M	SD	F	Sig.
Depression	22.6	4.7	23.2	1.8	36.5	6.8	638.58	.004

p<0.01 M=mean; SD=standard deviation, CI= confidence interval

Table 7 depicts statistically significant mean differences ($F(2, 367) = 638.58$, $p < 0.01$) in the reported levels of depression among respondents based on their marital status. Upon examining the mean scores of respondents within each category, it is evident that individuals who are divorced exhibit higher mean scores compared to those who are single or married. Moreover, the Tukey's post hoc analysis in the appendix indicates that divorced respondents show significant differences compared to both single and married individuals in terms of their reported levels of depression.

4. Discussions

This chapter presents the discussion of the major findings of the study. The order of the discussion presented in this chapter follows that of the results section; hence, the first section provides discussion of the results of the study on the prevalence of depression among CVD patients in the study area. Section two offers the discussion of results showing the presence of significant difference in the level of depressive symptoms across socio-demographic variables. The discussion also contrasts the findings of the present study with the reports of the previous studies.

The prevalence of depression among cardio vascular patients in the study area

Examining the prevalence of depression among CVD patients is one of the objectives of this study. Results indicated that 27.74% of the respondents reported to have minimal depression, 39.84% had mild depression, 24.73%had moderate level of depression and 20.83% of the respondents were found to have severe depression. Thus, the percentage of respondents having depression level in the two extremes (minimal and severe) is lower than that of mild and moderate levels of depression. This implies that in the current study area the number of respondents who have mild and mild level of depression is higher than that of moderate and severe. Therefore, the prevalence is characterized by mild level of depression which is represented by 39.84% of the respondents and followed by minimal level of depression which represents 27.34 % of the CVD patents who participated in the study.

Consistent with the above findings of the present study, Barefoot et.al (2012) reported that depression level increases by 70% in myocardial infarction, and a 60% increase in all-cause mortality, at follow-up of 17 years later. Depression is common among CVD patients; there is ample evidence that prevalence of depression is 20% higher in patients with heart failure than in healthy individuals (Saeed, 2014). However, conversely, Rugulies (2002) reported that depression is the contributing factors for the development of CVD.

Depression and Anxiety Symptoms among Patients with CVD differ across Socio-Demographic Variables

This study examined whether or not depression symptoms vary across the selected socio-demographic variables. Results indicate that depression symptoms vary between male and female CVD patients. Specifically, female CVD patients were found to have higher level of depression than male CVD patients. On the other hand, there are statistically significant mean differences in the level of depression among respondents across age groups. Specifically, analysis indicates that respondents who are in the age group of 47-60 are found to have significant difference from respondents who are in the age range of 20-35 years and above 60 years. Similarly, respondents in the age group of 36-46 are found to have significant difference form respondents who are in the age range of 47-60 years and above 60 years.

Similarly, in terms of educational status, the findings indicate that there are statistically significant mean differences in the level of depression and anxiety among respondents. The analysis indicates that respondents who are illiterate have significant difference from those who have secondary and college diploma and above. In addition, respondents who have primary level of education have significant difference from those who have secondary level and college diploma and above educational status. Regarding marital status, results indicate that there are statistically significant mean differences in the level of depression among respondents across marital status. The analysis indicates that unmarried respondents are found to have significant difference from divorced. Similarly, married respondents are found to have significant difference from divorced respondents.

Reports from previous studies largely support the above findings of the present study. For instance, Wang et.al (2011) reported that approximately 5-9% of women and 2–3% of men with cardiovascular disease are affected by major depressive disorder. Moreover, Bayany et.al. (2011) indicated that as the patients got older, their depression was exacerbated. Wang et, al (2011) also added that unmarried CVD respondents possessed higher depression level compared to the married respondents. However, Siew et.al (2011) conversely argued that there is not significant difference between depression scores of participants stratified based on age, gender, race, education, or income.

5. Conclusion

Depression stands out as a prevalent psychiatric comorbidity among patients with cardiovascular disease. Existing literature consistently highlights that the chronic nature of CVD often triggers negative psychological responses in patients. This study aimed to explore the prevalence of depression and anxiety among the study participants, as well as to investigate potential variations in depression symptoms across different demographic factors such as sex, age, educational level, and marital status. The findings of this study unveiled that female CVD patients exhibited higher levels of depression compared to their male counterparts. Moreover, patients in the age brackets of 20-35 and 36-46 displayed more pronounced symptoms of depression when contrasted with patients aged 47-60 and over 60 years. Additionally, the results indicated that individuals with lower educational attainment, including illiterates and primary education completers, showed more pronounced symptoms of depression compared to those with secondary education and college diploma or higher qualifications. Furthermore, the study findings revealed that divorced patients demonstrated higher levels of symptomatic depression in comparison to unmarried and married individuals.

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