

## Research Paper

## Smoking and Depression in Ischemic Heart Patients of Coronary Care Unit and Post-coronary Care Unit: A Cross-sectional Study

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**ABSTRACT**

**Background:** Depression has been a psychological problem in people's lives for centuries. This disorder has become the basis of other chronic diseases with changes in the person's lifestyle in the form of reducing physical activity, increasing smoking, appetite, or weight, or creating problems in the optimal control of other diseases accompanied by chronic.

**Materials and Methods:** This cross-sectional study was conducted in 2018 in the Cardiology Department of Shahid Mohammadi Hospital in Bandar Abbas City, Iran. The data collection tool was a demographic form and the standardized Beck questionnaire.

**Results:** A total of 63.4% of people were women, and 36.6% were men. Most participants were between 41 and 60 years old and had a bachelor's degree or were illiterate. Of the studied subjects, 29.2% were smokers, and 31.5% were passive smokers.

**Conclusion:** Based on age and educational level, there is a strong correlation between smoking and depression in ischemic heart patients.

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## Introduction

**D**epression is among the most common and costly debilitating diseases in different countries [1]. This common mental disorder dramatically impacts individuals, families, and communities [2]. People suffering from this disorder face approximately 22 times more defects and inability to perform tasks compared to healthy people [3]. This disease can be related to ischemic heart disease risk factors, such as smoking [3-5]. Coronary artery disease is one of the most common causes of death worldwide [6]. Tobacco use is one of the most important causes of premature death worldwide, yet it is the most avoidable [7]. Since smoking and depression have a vicious cycle and the relationship between depression and coronary heart disease can be mutual, knowing the relationship between these variables is essential. Evidence shows that depression is a significant risk factor for developing cardiovascular diseases in healthy people and people with previous cardiovascular diseases [8]. Depression can affect cardiovascular function. On the other hand, cardiovascular diseases can lead to depression. Also, depression worsens the prognosis of patients with proven cardiovascular problems. Major depression increases the risk of a cardiovascular accident in the first 12 months after the diagnosis of coronary artery disease in a patient. This increase in risk is independent of factors such as the extent of the disease, left ventricular output, and smoking [9].

Compared to non-depressed people, depressed patients are at a significant risk of dying from cardiovascular events up to 10 years after the diagnosis of coronary artery disease [10]. Major depression increases the mortality rate 6 to 18 months after the stroke independent of risk factors, such as arrhythmias and previous history of heart attack [11, 12].

Due to the lack of a comprehensive study, this research investigates the relationship between smoking and depression in ischemic heart patients in the coronary care unit and post-coronary care unit.

## Materials and Methods

### Study participants and design

This was a cross-sectional descriptive-analytical study that was conducted in 2018. A total of 216 patients hospitalized in the Cardiac Department of Shahid Mohammadi Hospital in Bandar Abbas City, Iran, were studied via convenience sampling.

The inclusion criteria for the study were having ischemic heart disease confirmed by a doctor and having written consent to enter the exam. Meanwhile, the exclusion criteria consisted of being under 30 years of age and not agreeing to enter the exam.

### Study measurements and definitions

The data collection tool was a personal profile form and the standardized Beck questionnaire. The findings indicated that the Beck depression questionnaire is a valid, well-known, reliable, and effective tool to measure depression [13-15]. The overall score of each person in the test-back is determined by summing the scores in all aspects, where the score is 0-9 for no depression, 10-20 for mild depression, 21-30 for moderate depression, and 31-63 for severe depression. A person whose depression score is greater than or equal to 12 is considered depressed. The Beck depression inventory includes 21 groups of questions and was compiled for the first time in 1961 by Aaron Beck, Beckward, Mendelsohn, Mark, and Arbaugh [16]. The content of the Beck depression inventory items was collected with the thoughts and opinions of clinical experts about the symptoms of depressed patients, and 6 of the 9 Diagnostic and Statistical Manual Mental Disorders Category III items for the diagnosis of depression were also included [17].

### Statistical analysis

After completing the questionnaires, the data were collected and entered into the SPSS software, version 25. The chi-square and the Fisher exact tests were used to compare the qualitative variables between study groups.  $P < 0.05$  was considered significant.

## Results

A total of 63.4% of the subjects were female and 36.6% were male. Meanwhile, 41.2% were aged between 41 and 60 years. Most participants (48.6%) were illiterate or had a middle school degree. In addition, 40.3% of smokers were stay-at-home, 24.1% were self-employed, 26.4% were employees, and 9.3% were retired (Table 1). According to the study subjects' medical history, 31% had a history of neurologic disease, 38.4% had a history of angiography, 21.7% had undergone an angiogram within the previous month, 18.1% within the last 6 months, 60.2% had experienced angiography more than six months before, and 1.4% of the participants underwent open heart surgery in the past (Table 1). Also, 29.2% of the participants were smokers. The percentage of passive smokers was 31.5%. In addition, 39.7% of the

**Table 1.** Frequency and percentage of variables in the studied subjects

Variables		No. (%)
Gender	Man	79(36.6)
	Woman	137(63.4)
Age (y)	30-40	79(36.6)
	41-60	89(41.2)
	>60	48(22.2)
Level of education	Illiterate and middle school degree	105(48.6)
	Diploma degree and associate degree	66(30.6)
	Bachelor's degree and higher	45(20.8)
Job	Unemployed or housewife	87(40.3)
	Self-employed	52(24.1)
	Employee	57(26.6)
	Retired	20(9.3)
History of neurology disease	Yes	67(31.0)
	No	149(69.0)
History of angiography	Yes	83(38.4)
	No	133(61.6)
Angiography time	In the past month	18(21.7)
	In the last 6 months	15(18.1)
	>6 months of age	50(60.2)
History of open heart surgery	Yes	3(1.4)
	No	213(98.6)
Smoking	Yes	63(29.2)
	No	153(70.8)
Passive smoking	Yes	68(31.5)
	No	148(68.5)
Type of drugs used	Cigarette	25(39.7)
	Hookah	22(34.9)
	Nas drug	0(0.0)
	Other cases	4(6.3)
	Cigarette/Hookah	5(7.9)
	Cigarette/Nas drug	7(11.1)

Variables		No. (%)
Cigarette numbers	Zero thread	179(82.9)
	1 to 10 thread	22(10.2)
	11 to 20 thread	15(6.9)
Depression	Yes	141(55.3)
	No	75(44.7)
Severity of depression	Mild	74(52.5)
	Medium	58(41.1)
	Intense	9(6.4)

population smoked cigarettes, 34.9% used hookah, 0% Nas, 6.3% used other drugs, 7.9% used hookah and cigarettes, and 11.1% used both. Additionally, 82.9% of persons smoked no cigarettes daily, 10.2% smoked one to ten cigarettes daily, and 6.9% smoked eleven to twenty cigarettes daily (Table 1). The prevalence of depression in the study subjects was 55.3%. Meanwhile, 52.5% of

those people had mild depression, 41.1% had moderate depression, and 6.4% had severe depression (Table 1).

The prevalence of depression was 70% in smokers and 84.7% in non-smokers in the age range of 30 to 40 years; however, no significant correlation was found between these two variables using the chi-square test ( $P=0.102$ ). According to results of the severity of depression in

**Table 2.** Frequency and percentage of depression and severity in people with and without smoking according to age

Age (y)	The Presence of Depression and Its Severity		Smoking, No. (%)		Test Statistics	df	P
			Yes	No			
30-40	Depression	No	9(30.0)	9(15.3)	2.680	1	0.102
		Yes	21(70.0)	50(84.7)			
	Severity of depression	Mild	14(66.7)	32(64.0)	2.055	-	0.405
		Medium	7(33.3)	13(26.0)			
		Intense	0(0.0)	5(10.0)			
41-60	Depression	No	4(25.0)	42(66.7)	9.107	1	0.003
		Yes	12(75.0)	21(33.3)			
	Severity of depression	Mild	6(50.0)	8(38.1)	4.392	-	0.112
		Medium	4(33.3)	13(61.9)			
		Intense	2(16.7)	0(0.0)			
>60 years	Depression	No	5(29.4)	6(19.4)	-	-	0.486
		Yes	12(70.6)	25(80.6)			
	Severity of depression	Mild	0(0.0)	14(56.0)	14.092	-	<0.001
		Medium	12(100.0)	9(36.0)			
		Intense	0(0.0)	2(8.0)			

**Table 3.** Determining the relationship between smoking and depression in ischemic Heart patients based on passive smoker

Type of Drugs Used	The Presence of Depression and Its Severity		Smoking, No. (%)	
			Yes	No
Cigarette	Depression	No	13(52.0)	0(0.0)
		Yes	12(48.0)	0(0.0)
	Severity of depression	Mild	8(66.7)	0(0.0)
		Medium	2(16.7)	0(0.0)
		Intense	2(16.7)	0(0.0)
Hookah	Depression	No	3(13.6)	0(0.0)
		Yes	19(86.4)	0(0.0)
	Severity of depression	Mild	8(42.1)	0(0.0)
		Medium	11(57.9)	0(0.0)
		Intense	0(0.0)	0(0.0)
Other cases	Depression	No	0(0.0)	0(0.0)
		Yes	4(100.0)	0(0.0)
	Severity of depression	Mild	4(100.0)	0(0.0)
		Medium	0(0.0)	0(0.0)
		Intense	0(0.0)	0(0.0)
Cigarette and hookah	Depression	No	2(40.0)	0(0.0)
		Yes	3(60.0)	0(0.0)
	Severity of depression	Mild	0(0.0)	0(0.0)
		Medium	3(100.0)	0(0.0)
		Intense	0(0.0)	0(0.0)
Cigarette and Nas	Depression	No	0(0.0)	0(0.0)
		Yes	7(100.0)	0(0.0)
	Severity of depression	Mild	0(0.0)	0(0.0)
		Medium	7(100.0)	0(0.0)
		Intense	0(0.0)	0(0.0)

adults in the age range of 30 to 40 years, most were at a mild level in both groups with and without smoking, and according to the Fisher exact test, there was no significant correlation between these two factors ( $P=0.405$ ) (Table 2).

Among individuals in the age range of 41 to 60 years, the occurrence of depression was 75% among smokers

compared to 33.3% among non-smokers ( $P=0.0003$ ). The analysis of depression levels in this age group indicated that smokers mostly had mild depression while non-smokers mostly had moderate levels. However, the Fisher exact test did not show a significant relationship between smoking and depression ( $P=0.112$ ) (Table 2).

**Table 4.** Frequency and percentage of depression and its severity in people with and without smoking according to their education level

Level of Education	The Presence of Depression and Its Severity		No. (%)		Test Statistics	df	P
			Smoking				
			Yes	No			
Illiterate or middle school degree	Depression	No	3(9.7)	13(17.6)	1.464	-	0.384
		Yes	28(90.3)	61(82.4)			
	Severity of depression	Mild	8(28.6)	25(41.0)	4.203	2	0.414
		Medium	18(64.3)	30(49.2)			
		Intense	2(7.1)	6(9.8)			
Diploma or associate degree	Depression	No	12(85.7)	29(55.8)	5.301	1	0.040
		Yes	2(14.3)	23(44.2)			
	Severity of depression	Mild	0(0.0)	17(73.9)	6.806	-	0.15
		Medium	2(100.0)	5(21.1)			
		Intense	0(0.0)	1(75.0)			
Bachelor's degree and higher	Depression	No	3(16.7)	15(55.6)	9.131	1	0.009
		Yes	15(83.3)	12(44.4)			
	Severity of depression	Mild	12(80.0)	12(100.0)	-	-	0.005
		Medium	3(20.0)	0(0.0)			
		Intense	0(0.0)	0(0.0)			

In the group of people older than 60 years, those who smoked cigarettes had a 70.6% prevalence of depression, while individuals who did not smoke had an 80.6% prevalence. According to the Fisher exact test, these two factors had no significant correlation ( $P=0.486$ ). Most of the individuals who did not use tobacco were at a mild level of depression, whereas most of those who did were at a moderate level. The Fisher exact test revealed a substantial correlation between these two variables ( $P<0.001$ ) (Table 2).

The findings showed that 48% of smokers had depression, the majority of which was minor. The prevalence of depression in hookah users was 86.4%, most of which were in the moderate range. Compared to people who used other substances, smokers had a 100% prevalence of depression, all of which were mild. The outbreak of depression among cigarette or hookah smokers was 60%, and all were moderate. The outbreak of depression among smokers was 100%, and all were moderate (Table 3).

People with diploma or post-diploma education were more likely to experience depression compared to individuals who did not smoke (14.3% vs 44.2%). Meanwhile, the chi-square test revealed a significant correlation between these two variables ( $P=0.0040$ ). The majority of smokers in the group had moderate levels of depression, and the majority of non-smokers in the group had mild levels of depression. According to the results of the severity of depression in adults with diploma or post-diploma education, the Fisher exact test revealed no significant correlation between these two variables ( $P=0.150$ ) (Table 4).

This study used the chi-square test to confirm the significant correlation between these factors ( $P=0.009$ ). Most adults with a bachelor's degree or higher experienced mild depression regardless of smoking habit. This study also used the Fisher exact test to show the significant relationship between these two variables ( $P=0.005$ ) (Table 4).

## Discussion

The majority of the participants in the current study reported mild depression, which is comparable with the study of Foruzandeh et al. [18]. Accordingly, the prevalence of depression was likewise significant among cardiac patients, which can result from the difficulties associated with illness and the decline in people's capacities and optimism for the future.

The current study found a substantial age-dependent connection between smoking and depression in ischemic heart patients, with depression being significantly greater in individuals in the age range of 41 and 62 years and more severe in subjects over 60 years. Based on their degree of education in patients, ischemic heart patients in the current study had a strong link between smoking and depression. Additionally, smoking and depression are strongly associated with those with a diploma, a post-diploma, or a bachelor's degree. Additionally, depression was more prevalent in those with lower levels of education, as demonstrated by studies by Foruzandeh et al. [18] and Sephermanesh et al. [19]. The cause of this is that people with lower levels of education have fewer abilities to handle life's difficulties, accept their illness, and manage the mental weight of their condition.

## Conclusion

Based on age and educational level, there is a strong correlation between smoking and depression in ischemic heart patients. Additional studies using more participants are advised because more studies involve various numbers. The patients' lack of participation and inability to provide appropriate questionnaire responses could be considered limitations.

## Ethical Considerations

### Compliance with ethical guidelines

Consent for publication was obtained from all participants. Hormozgan University of Medical Sciences Ethics Committee approved the study (Code: IR.HUMS.REC.1398.083).

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## Authors' contributions

Conceptualization, data curation: Sholeh Namazi; Project administration and methodology: Mohammad-Hosein Sheybani-Arani; Supervision: Mahdi Nikpour; Resources and formal analysis: Hamzeh Seddigh; Funding acquisition: Ava Panahi-Azar; Data validation: Ava Panahi-Azar; Investigation and writing original draft: Mahdieh Sadeghi; Review and editing: Mahdi Nikpour.

## Conflict of interest

The authors declared no conflict of interest.

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