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The Effect of Unhealthy Lifestyle on the Development of Ischemic Heart Disease

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ABSTRACT

Background: Ischemic heart disease (IHD) remains a major global health burden, with lifestyle factors playing a pivotal role in its development. This study aimed to assess the association between unhealthy lifestyle behaviors and the risk of developing IHD among adults in Jazan, Saudi Arabia.

Methods: A case-control study was conducted with 316 participants (158 IHD cases and 158 matched controls, 1:1 Ratio) at Prince Mohammed bin Nasser Specialized Hospital. Participants were selected via simple random technique. Data were collected using validated questionnaires assessing sociodemographic data, physical activity, diet, sleep quality, psychological status, and smoking habits. Statistical analysis included Pearson's correlation and regression models, with significance set at $p < 0.05$.

Results: Low physical activity, current smoking, and low income were significantly associated with higher odds of IHD. Participants with no weekly physical activity had a significantly higher prevalence of IHD ($p = 0.001$), as did those with no daily physical activity ($p = 0.028$). Smoking was a strong predictor, with current and former smokers showing higher IHD rates ($p < 0.0001$). Lower income (<10,000 SR) was also significantly linked to IHD ($p = 0.009$).

Conclusion: Unhealthy lifestyle behaviors, particularly smoking, physical inactivity, and low socioeconomic status, were significantly associated with the development of ischemic heart disease. Targeted public health interventions focusing on lifestyle modifications may reduce the burden of IHD in high-risk populations.

Keywords: Ischemic heart disease, physical inactivity, smoking, unhealthy lifestyle, Saudi Arabia.

INTRODUCTION

Ischemic Heart Disease, commonly known as coronary artery disease or heart attack, is characterized by inadequate blood supply to the heart muscle due to atherosclerosis a condition marked by the accumulation of plaque in the coronary arteries [1-3]. Ischemic heart disease (IHD) stands as a global health challenge, with its prevalence and impact on morbidity and mortality closely linked to various lifestyle factors [1,2]. Among these factors, diet, physical activity, sleep quality, mental health, and cigarette smoking play pivotal roles in the complex interplay influencing the development and progression of ischemic heart disease [3,4,8,]. This comprehensive exploration begins with an introduction to the multifaceted nature of IHD, followed by a nuanced examination of the types, relationships, consequences, and essential information surrounding this cardiovascular condition [5,6,7].

This insidious process unfolds through intricate interactions of lifestyle choices, genetic predispositions, and environmental factors [9-11]. As such, a closer look at dietary patterns reveals their substantial influence on IHD development. Diets rich in saturated fats, trans fats, cholesterol, and excessive sodium contribute to dyslipidemia, fostering the deposition of atherogenic plaques and narrowing coronary vessels, thereby increasing the risk of ischemic events [12].

Physical activity, a cornerstone of cardiovascular health, is integral in preventing IHD. Regular exercise helps maintain a healthy weight, control blood pressure, and improve lipid profiles [13,14]. Conversely, sedentary lifestyles contribute to obesity, insulin resistance, and unfavorable lipid profiles, all of which amplify the risk of atherosclerosis and subsequent ischemic events. Sleep quality emerges as another crucial aspect, with inadequate or poor-quality sleep linked to adverse cardiovascular outcomes [15,16]. Chronic sleep deprivation may contribute to hypertension, obesity, and insulin resistance, further predisposing individuals to IHD [17].

Mental health, specifically anxiety and depression, has garnered increasing attention for its impact on cardiovascular health [18]. The intricate bidirectional relationship between mental health and IHD involves physiological and behavioral pathways. Stress-related responses may contribute to hypertension and inflammation, accelerating atherosclerosis [5,19,20]. In turn, the burden of IHD can exacerbate mental health challenges, creating a complex interplay that requires a holistic approach to healthcare [21].

Tobacco use, a well-established risk factor for IHD, introduces harmful substances that induce endothelial dysfunction, inflammation, and thrombosis. Both active and passive smoking contribute significantly to the progression of atherosclerosis, increasing susceptibility to ischemic events [22,23]. The global prevalence of smoking further underscores its role in shaping the burden of IHD internationally [24].

Diet plays a crucial role in the development of ischemic heart disease, particularly when it is characterized by unhealthy eating habits. Diets high in saturated fats, trans fats, cholesterol, and

sodium contribute to the buildup of plaque in the arteries, leading to atherosclerosis—a primary cause of ischemic heart disease. Additionally, excessive consumption of processed foods, sugary beverages, and low intake of fruits, vegetables, and whole grains increases the risk of obesity, hypertension, and high cholesterol levels. Therefore, maintaining a balanced and heart-healthy diet is essential in preventing the onset and progression of ischemic heart disease.

In Saudi Arabia, a nation undergoing rapid socio-economic transformations, the rise in IHD prevalence aligns with shifts in lifestyle choices. Sedentary behaviors, poor dietary habits, and increased smoking rates contribute to the escalating burden of cardiovascular diseases [25]. Internationally, the globalization of unhealthy lifestyle patterns has led to a rise in IHD prevalence across diverse populations, necessitating a comprehensive, global approach to preventive healthcare [26].

The intricate relationships between unhealthy lifestyle choices and the development of ischemic heart disease underscore the need for targeted interventions that address diet, physical activity, sleep quality, mental health, and smoking [27,28]. Acknowledging the profound consequences of these lifestyle factors is essential for designing effective preventive strategies that promote cardiovascular health on both individual and societal levels [6,16,29]. The significance of this study lies in addressing the lack of data on how unhealthy lifestyle factors contribute to the development of ischemic heart disease within the specific research setting. Despite the growing burden of cardiovascular diseases, there is limited local data linking lifestyle habits—such as poor diet, physical inactivity, and smoking—to the onset of ischemic heart disease. This gap hinders the development of targeted prevention strategies and effective public health interventions. By generating context-specific evidence, this study aims to fill the knowledge gap and support informed decision-making in healthcare planning and disease prevention. The complex interplay between lifestyle choices and the trajectory of IHD warrants a concerted effort to foster a global understanding and commitment to mitigating this prevalent cardiovascular condition. The current study aimed to investigate the effect of an Unhealthy Lifestyle on the Development of Ischemic Heart Disease at Prince Mohammed bin Nasser Specialize Hospital Jizan.

METHODS

Study Design

This study adopted a case-control design to explore the effect of an unhealthy lifestyle on the development of ischemic heart disease (IHD). This design allowed for the comparison of individuals recently diagnosed with IHD (cases) to those without the disease (controls), aiming to identify lifestyle-related risk factors associated with the condition.

Study Area

The research was conducted in Jazan, located in the southwest corner of Saudi Arabia. The region is characterized by a predominantly homogenous population with shared ethnic and socioeconomic backgrounds. Participants were recruited randomly from Prince Mohammed bin Nasser

Specialized Hospital, a reputable facility known for its specialized services. This hospital served as the primary data collection site, offering a relevant clinical context for the study.

Study Participants

A total of 316 participants were recruited for this study, comprising 158 newly diagnosed ischemic heart disease cases and an equal number of age- and gender-matched controls. This sample size was designed to ensure sufficient statistical power for identifying associations between unhealthy lifestyle factors and IHD.

Inclusion and Exclusion Criteria

The inclusion criteria for cases included individuals aged 18–65 years who had been newly diagnosed with ischemic heart disease within the last 1–3 months and expressed a willingness to participate. Controls were individuals in the same age range who had no history of ischemic heart disease and were also willing to participate.

The exclusion criteria for both groups included any history of other cardiovascular diseases (e.g., heart failure, congenital or valvular heart disease), pre-existing psychiatric disorders affecting eating behaviors, severe renal or hepatic impairment, malignancy, pregnancy or breastfeeding, inability to provide informed consent, inability to comprehend or respond to the questionnaire, or participation in another conflicting clinical trial.

Sample Size

The sample size was calculated using EPI Info software with the following parameters: a 95% confidence interval, alpha of 0.05, 80% power, and a 1:1 case-control ratio. The initially calculated sample size was 288 participants; however, to account for a 10% non-response rate, 28 additional participants were included, bringing the total to 316 participants.

Sampling Technique

Participants were approached during their clinic visits and were randomly selected according to the inclusion and exclusion criteria. They were provided with a clear explanation of the study's purpose, procedures, and expectations. Informed consent was obtained from all participants prior to their involvement in the study. Participants were selected via simple random technique.

The study employed a frequency matching technique to ensure comparability between cases and controls in terms of age and gender. This approach minimized confounding variables and enhanced internal validity. Data were collected through face-to-face interviews and from medical records using structured questionnaires.

Data Collection Tools

Data were gathered through validated questionnaires administered in face-to-face interviews. The Arabic versions of the tools, previously validated in other studies, were used [15-17]. The questionnaire consisted of three main sections:

1. Demographic and Socioeconomic Information: This included age, gender, educational background, BMI, height, weight, family size, marital status, income level, parents' educational level, and residence location.

2. Lifestyle and Psychological Assessments:
    a. Diet Quality Questionnaire (DQQ): Adapted for use in this study, this 29-item tool measured daily intake of various food items. It demonstrated good internal consistency (reliability = 0.78–0.81).
    b. International Physical Activity Questionnaire (IPAQ): Developed in 1998, it assessed physical activity across multiple domains, yielding MET-minutes per week scores. Its reliability ranged between 0.77–0.81.
    c. Pittsburgh Sleep Quality Index (PSQI): This instrument measured sleep quality and disturbances over the past month with a global scoring system, showing strong reliability.
    d. Depression Anxiety Stress Scales-21 (DASS-21): This 21-item self-report tool measured symptoms of depression, anxiety, and stress using a 4-point Likert scale. It demonstrated high reliability (0.82–0.97).
    e. Tobacco Use Questionnaire (TUQ): This comprehensive tool examined patterns, behaviors, and attitudes related to tobacco use. It included multiple-choice and open-ended questions and had a reliability estimate between 0.78–0.88.

Statistical Analysis

Data entry and analysis were performed using IBM SPSS version 23. Descriptive statistics were used to present the data, with frequencies and percentages for categorical variables and means with standard deviations for continuous variables. To evaluate the relationship between unhealthy lifestyle factors and ischemic heart disease, Pearson's correlation was employed. In addition, linear regression analysis was used to identify predictors of ischemic heart disease. In addition, chi square test was used to evaluate the relationship between cases and controls participants. A p-value of less than 0.05 was considered statistically significant.

Study Variables

The dependent variable in this study was ischemic heart disease. The independent variables included unhealthy lifestyle behaviors and socioeconomic factors such as age, gender, marital status, and economic status. Lifestyle components included physical activity, diet, tobacco use, alcohol intake, sleep quality, stress, and occupational factors.

Ethical Considerations

Ethical approval for the study was obtained from the Jazan University Research Ethics Committee and Prince Mohammed bin Nasser Specialized Hospital. All participants provided written informed consent. They were assured of their right to refuse participation or withdraw at any time without any consequences. All collected data were kept strictly confidential and were used solely for research purposes.

RESULTS

The study included 320 participants. The mean age was 55.17 $\pm$ 14.72 years with median age of 55 years. Age ranged from 15 to 91 years. The majority of study participants were male (n= 235,

73.4%) and predominantly within the age groups of 40–59 years (n= 135, 42.2%) and 60–79 years (n= 128, 40%). Most were married (n= 251, 78.4%) and resided in rural areas (n= 195, 60.9%). In terms of income, over half reported earning between 10,000–15,000 SR (n= 178, 55.6%). Parental education levels were generally low, with a significant portion of fathers being illiterate (n= 203, 63.4%) and an even higher percentage of mothers being illiterate (n= 266, 83.1%). Most families consisted of 1–5 members (n= 157, 49.1%) or 6–10 members (n= 138, 43.1%). Table 1 provides detailed sociodemographic distribution of study participants.

Table 1: Sociodemographic characteristics of study participants

Variable		Frequency	Percent
Gender	Male	235	73.4
	Female	85	26.6
Age group	Less than 20	4	1.3
	20-39	40	12.5
	40-59	135	42.2
	60-79	128	40
	80 or more	13	4.1
Marital status	Single	26	8.1
	Married	251	78.4
	Divorced	13	4.1
	Widow	30	9.4
Residency	Urban	125	39.1
	Rural	195	60.9
Income	Less than 10000 SR	133	41.6
	10000-15000 SR	178	55.6
	More than 15000 SR	9	2.8
Father education	Illiterate	203	63.4
	Primary school	85	26.6
	Secondary school	25	7.8
	University	5	1.6
	Postgraduate	2	0.6
Mother education	Illiterate	266	83.1
	Primary school	40	12.5
	Secondary school	11	3.4
	University	1	0.3
	Postgraduate	2	0.6
Family members	1-5	157	49.1
	6-10	138	43.1

	More than 10	25	7.8
Body mass index	Underweight	5	
	Normal	147	
	Overweight	119	
	Obesity class 1	32	
	Obesity class 2	11	
	Morbid obesity	6	

Among the study participants, nearly half reported having ischemic heart disease (n= 158, 49.4%), while the other half did not (n= 162, 50.6%). Regarding smoking status, 150 participants (46.9%) were non-smokers, 96 (30%) were ex-smokers, and 74 (23.1%) were current smokers. Physical activity was notably low, with 210 participants (65.6%) reporting no physical activity per week, and 214 (66.9%) indicating no physical activity per day. Only a small proportion engaged in regular exercise, with 44 participants (13.8%) exercising two days a week and 42 (13.1%) engaging in 30 minutes or more of daily activity.

Table 2: Clinical characteristics of study participants

Variable		Frequency	Percent
Ischemic heart disease	Yes	158	49.4
	No	162	50.6
Smoking status	Non-smoker	150	46.9
	Ex-smoker	96	30
	Current smoker	74	23.1
Physical activity per week	None	210	65.6
	One day	20	6.3
	Two days	44	13.8
	Three days	36	11.3
	Four days	8	2.5
	Five days	2	0.6
Physical activity per day	None	214	66.9
	Less than 30 minutes	64	20
	30 minutes or more	42	13.1

The relationship between sociodemographic characteristics and the presence of ischemic heart disease (IHD) among participants (n = 320) showed several statistically significant associations. A significantly higher prevalence of IHD was observed among those with lower income (<10,000 SR), with 79 affected individuals compared to 54 without IHD ($p = 0.009$). Smoking status showed a highly significant association ($p < 0.0001$), where ex-smokers (66 with IHD vs. 30 without) and non-smokers (70 vs. 80) had differing distributions compared to current smokers (22 vs. 52). Physical activity per week was also significantly related ($p = 0.001$), with those not engaging in

weekly activity (112 with IHD vs. 98 without) more frequently affected. Similarly, physical activity per day showed a significant association (p = 0.028), with a higher number of IHD cases among those reporting no daily activity (116 vs. 98). Other variables such as gender, age, residency, and parental education did not show statistically significant associations with IHD in this sample.

Table 3: Relationship between sociodemographic characteristics and presence of ischemic heart diseases

Variable		Ischemic heart disease		P value
		Yes	No	
Gender	Male	123	112	0.051
	Female	35	50	
Age group	Less than 20	2	2	0.071
	20-39	17	23	
	40-59	62	73	
	60-79	74	54	
	80 or more	3	10	
Marital status	Single	11	15	0.206
	Married	123	128	
	Divorced	10	3	
	Widow	14	16	
Residency	Urban	56	69	0.116
	Rural	102	93	
Income	Less than 10000 SR	79	54	0.009
	10000-15000 SR	76	102	
	More than 15000 SR	3	6	
Father education	Illiterate	111	92	0.085
	Primary school	31	54	
	Secondary school	13	12	
	University	2	3	
	Postgraduate	1	1	
Mother education	Illiterate	136	130	0.596
	Primary school	16	24	
	Secondary school	5	6	
	University	0	1	
	Postgraduate	1	1	
Family members	1-5	72	85	0.343
	6-10	71	67	

	More than 10	15	10	
BMI	Underweight	2	3	0.462
	Normal	74	73	
	Overweight	56	63	
	Obesity class 1	19	13	
	Obesity class 2	3	8	
	Morbid obesity	4	2	
Smoking status	Non-smoker	70	80	<0.0001
	Ex-smoker	66	30	
	Current smoker	22	52	
Physical activity per week	None	112	98	0.001
	One day	12	8	
	Two days	22	22	
	Three days	6	30	
	Four days	6	2	
	Five days	0	2	
Physical activity per day	None	116	98	0.028
	Less than 30 minutes	28	36	
	30 minutes or more	14	28	

The weekly consumption patterns of various food groups among participants (n = 320) revealed that the majority reported daily intake of vegetables (221, 69.1%) and fruits (216, 67.5%). White meat was also commonly consumed, with 166 participants (51.9%) eating it six times per week, and 79 (24.7%) consuming it daily. Red meat intake was less frequent; over half of the participants (171, 53.4%) consumed it only once per week, while 42 (13.1%) did not consume red meat at all. Fast food consumption varied, but the highest proportion of participants (91, 28.4%) consumed it three times per week, while 66 (20.6%) did not consume fast food at all. Overall, daily consumption was most prevalent for vegetables, fruits, and white meat, while red meat and fast food were consumed less frequently.

In multivariable logistic regression model (Table 4), fruit consumption emerged as a significant predictor of ischemic heart disease, with each additional day of fruit intake associated with a 32.2% increase in the odds of having IHD (OR = 1.322, 95% CI 1.118–1.562; p = 0.001). Smoking status was also strongly associated: ex-smokers had significantly lower odds of IHD compared to never-smokers (OR = 0.338, 95% CI 0.189–0.604; p < 0.001), while current smokers showed a nonsignificant trend toward higher odds (OR = 1.803, 95% CI 0.895–3.630; p = 0.099). Other dietary factors (vegetables, white meat, red meat, fast food) and physical activity metrics did not reach statistical significance in this model. Income, although showing increasing ORs for higher brackets, was not significantly related to IHD after adjustment.

Table 4: Multivariable Logistic Regression Analysis of Lifestyle and Dietary Factors Associated with IHD				
Variable	B	Exp(B)	95% CI for Exp(B)	P value
Income				0.193
10 000–15 000 SR	0.413	1.511	0.878 – 2.600	0.137
> 15 000 SR	1.089	2.970	0.569 – 15.492	0.196
Smoking Status				< 0.001
Ex-smoker	–1.085	0.338	0.189 – 0.604	< 0.001
Current smoker	0.589	1.803	0.895 – 3.630	0.099
Physical Activity (days/week)				0.387
1 day	–0.018	0.982	0.232 – 4.151	0.981
2 days	0.276	1.318	0.317 – 5.486	0.704
3 days	1.459	4.303	0.726 – 25.515	0.108
4 days	–0.291	0.747	0.076 – 7.367	0.803
5 days	21.946	3 395 325 482.814	0.000 – –	0.999
Physical Activity				0.657
< 30 min	0.608	1.837	0.489 – 6.898	0.368
≥ 30 min	0.651	1.918	0.374 – 9.826	0.435
Vegetables	–0.046	0.955	0.823 – 1.109	0.549
Fruits	0.279	1.322	1.118 – 1.562	0.001
White meat	0.023	1.024	0.826 – 1.268	0.830
Red meat	–0.071	0.931	0.773 – 1.123	0.456
Fast food	–0.054	0.947	0.845 – 1.061	0.348
Constant	–1.616	0.199	—	0.033

The actual sleep duration varied among study participants and ranged from four to 13 sleeping hours. The mean duration of sleep was 7.39 $\pm$ 1.39 hours among study participants. Based on the sleep quality questionnaire results, most participants experienced good overall sleep health, with 91.9% rating their sleep as "somehow good" or "very good." However, specific sleep disturbances were common. The most frequently reported issues included difficulty falling asleep within 30 minutes (75.6%), waking up during the night or early morning (79.1%), and getting up to use the bathroom (77.8%) at least once or twice per week. In contrast, problems like loud snoring, coughing, difficulty breathing, feeling too hot or cold, nightmares, and pain during sleep were relatively rare, reported by less than 15% of participants. Use of sleep medication was very uncommon, with 95.9% reporting never using it. Similarly, difficulties staying awake during daily activities or maintaining motivation were minimal, as over 70% reported no such issues. The majority (72.8%) did not consider lack of enthusiasm a problem. Most respondents had a bed partner or room partner, yet disturbances from partners, such as loud snoring or restless

movements, were infrequent. Figure 1 shows sleep quality among study participants. Participants with low sleep quality had higher prevalence of IHD (P= 0.004).

The responses to the DASS-21 items among the 320 participants indicate generally low levels of depression, anxiety, and stress. For the depression subscale, most items were marked as "did not apply" by over 83% of participants, reflecting minimal depressive symptoms. However, the item "I found it hard to wind down" stood out, with only 42.8% selecting "did not apply" and 52.5% endorsing it "some of the time," suggesting this may reflect a more common subclinical experience. Similarly, responses to the anxiety and stress items showed high rates of minimal symptoms. Between 82.2% and 97.8% of participants reported that the anxiety and stress items did not apply to them, with only a small proportion (typically under 10%) selecting "some of the time." This suggests that mild symptoms of anxiety and stress were present in a minority, while the majority experienced low psychological distress overall. Figure 2 presents psychological state of study participants. Since most participants had normal levels of psychological state, even all participants had normal stress levels, none of scales had statistically significant relationship with the presence of IHD.

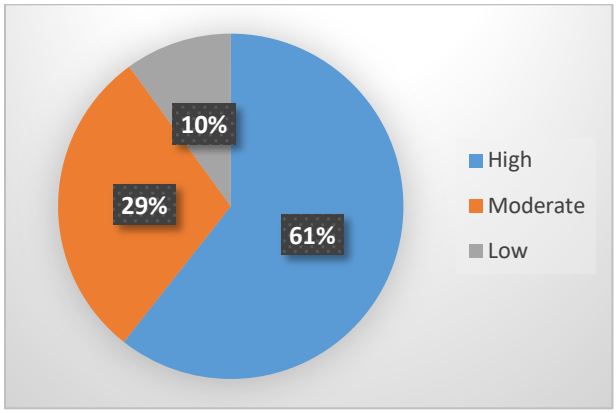

Figure 1: Sleep quality among study participants

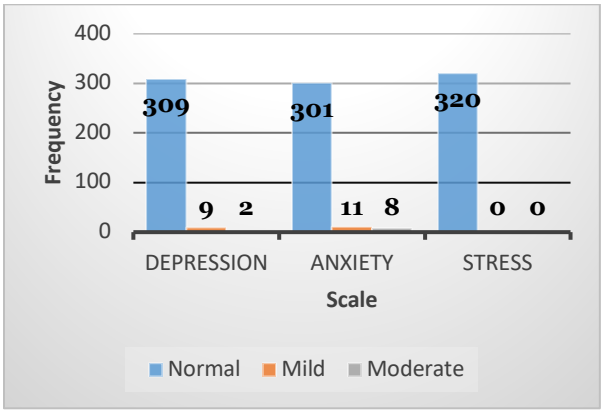

Figure 2: Psychological state among study participants

DISCUSSION

This study highlights the strong association between lifestyle-related factors and the prevalence of ischemic heart disease (IHD) in the studied population. Smoking, particularly among ex-smokers, emerged as a significant risk factor, aligning with global research that points to the long-term cardiovascular risks even after cessation. Additionally, physical inactivity was found to be a prominent contributor to IHD, emphasizing the importance of regular exercise in cardiovascular health. Interestingly, demographic variables such as gender, residency, and parental education level did not show significant associations, suggesting that lifestyle behaviors may outweigh these factors in determining IHD risk in this population. These findings reinforce the need for public health programs that target behavioral change, particularly in high-risk groups.

Another notable observation was the impact of income level on IHD risk, with lower income groups exhibiting higher rates of the disease. This supports the growing body of evidence indicating that socioeconomic status influences health outcomes by limiting access to healthcare, healthy food, and recreational facilities. Addressing these disparities requires systemic efforts that go beyond individual-level interventions. Health education campaigns and accessible community-based exercise programs could help mitigate the effects of poverty on heart disease. Moreover, integrated policies that support healthy living environments and reduce tobacco exposure are critical for effective prevention of IHD.

In terms of financial effect, morbidity, and death, cardiovascular diseases (CVDs) are a major problem on a worldwide scale. The prevalence of CVDs is high on a global scale [30-31]. Worldwide, cardiovascular diseases (CVDs) resulted in deaths of 17.9 million people in 2019, or 32% of the total [32]. This made them the top cause of death worldwide. In addition, people from all walks of life and all corners of the globe are not immune to CVDs. A large number of fatalities occur each year as a result of them [31]. The leading causes of death from cardiovascular disease (CVD) are ischemic heart disease (IHD) and stroke. The toll of cardiovascular disease mortality is disproportionately high in low- and middle-income nations [33]. The onset of cardiovascular diseases is influenced by several risk factors. Some examples of these are metabolic syndrome, high blood pressure, dyslipidemia, smoking, obesity, diabetes, lack of exercise, poor nutrition, heavy alcohol use, and psychological and social variables including stress [34]. The chance of having CVDs is further amplified when numerous risk factors are present. Societies and healthcare systems also have a heavy financial cost due to them.

Modifying one's lifestyle is an important step in preventing cardiovascular diseases. It is possible to alter risk factors linked to CVDs by making changes to one's way of life. A nutritious diet, regular exercise, not smoking, stress management, and a healthy weight are all examples of lifestyle changes that aim to reduce these risk factors. People may greatly lower their chances of getting CVDs by taking care of modifiable risk factors [35]. Modifying one's lifestyle provides a holistic strategy for preventing CVD. Alterations to one's way of life affect a number of risk variables all at once, in contrast to pharmacological treatments that aim at certain pathways or risk factors. Heart health is improved in the long run by making changes to one's lifestyle. People may greatly lower their future risk of having CVDs by starting healthy practices while they are young and sticking to them. These changes have a multiplicative influence on heart health, leading to long-term benefits and reduced risk of complications [36].

Heart health is significantly influenced by changes in lifestyle. To enhance cardiovascular health and lower the risk of CVDs, it is important to implement good behaviors including getting enough exercise, eating a balanced diet, not smoking, managing stress, and getting enough sleep. The importance of taking a holistic approach to making lifestyle changes is highlighted in this study. The benefits to cardiovascular health from combining several good practices are multiplied. To get the most out of these changes to your lifestyle, you need stick with them for the long haul. Although this study presents strong data, it is important to note that the impact of lifestyle changes

on cardiovascular health might be influenced by individual variables such genetics and preexisting diseases. Hence, targeted strategies that take into account the specifics of each person's situation are necessary [30].

This study is not without limitations. The cross-sectional design prevents the establishment of causality between lifestyle factors and IHD. Additionally, the reliance on self-reported data for variables such as smoking and physical activity may introduce recall or social desirability bias. Future research should adopt longitudinal designs to better understand the temporal relationship between behavioral factors and disease onset. Expanding the study to include larger and more diverse populations across different regions in Saudi Arabia would also provide more generalizable findings. Furthermore, incorporating clinical and biochemical data could enhance the accuracy of risk assessment and strengthen the evidence for targeted interventions.

CONCLUSION

The findings of this study underscore the significant role that unhealthy lifestyle factors play in the development of ischemic heart disease. Low income, smoking—particularly among ex-smokers—and physical inactivity were all strongly associated with the presence of IHD, suggesting that these modifiable behaviors and socioeconomic conditions are critical targets for preventive strategies. Despite no significant associations with gender, residency, or parental education, the results highlight how lifestyle behaviors such as lack of regular physical activity and tobacco use contribute substantially to cardiovascular risk. These insights call for the implementation of community-level interventions and public health initiatives focused on promoting healthy behaviors, improving physical activity levels, and supporting smoking cessation, particularly among high-risk populations. Addressing these factors through targeted education and accessible health services may effectively reduce the burden of ischemic heart disease in the region.

REFERENCES

1. Šulcová J, Murgová A. Psychosocial factors and cardiovascular diseases. Research Studies and Theoretical Analysis of the Actual Problems in Multidimensional Sphere. 117.
2. Kris-Etherton PM, Petersen KS, Després JP, Anderson CA, Deedwania P, Furie KL, et al. Strategies for promotion of a healthy lifestyle in clinical settings: pillars of ideal cardiovascular health: a science advisory from the American Heart Association. Circulation. 2021;144(24):e495–514.
3. Raghani PS. Insufficient Sleep and Onset of Coronary Artery Disease. 2022.
4. Smirmaul BP, Chamon RF, de Moraes FM, Rozin G, Moreira ASB, de Almeida R, et al. Lifestyle medicine during (and after) the COVID-19 pandemic. Am J Lifestyle Med. 2021;15(1):60–7.
5. Jaarsma T, Hill L, Bayes-Genis A, La Rocca HPB, Castiello T, Čelutkienė J, et al. Self-care of heart failure patients: practical management recommendations from the Heart

Failure Association of the European Society of Cardiology. Eur J Heart Fail. 2021;23(1):157–74.
6. Kwapong YA, Boakye E, Khan SS, Honigberg MC, Martin SS, Oyeka CP, et al. Association of depression and poor mental health with cardiovascular disease and suboptimal cardiovascular health among young adults in the United States. J Am Heart Assoc. 2023;12(3):e028332.
7. Mathur K, Sharma S, Hussain MS. Mini-review on the management of lifestyle disorders: attempting to keep Indians healthy for a bright future. Dis Diagn. 2023;12(3):144–50.
8. Cervera-Martínez J, Atienza-Carbonell B, Mota JC, Bobes-Bascarán T, Crespo-Facorro B, Esteban C, et al. Lifestyle changes and mental health during the COVID-19 pandemic: a repeated, cross-sectional web survey. J Affect Disord. 2021;295:173–82.
9. Feng V, Tumati S, Wang R, Bawa KK, Gallagher D, Herrmann N, et al. The relationship between oxidative stress and subjective sleep quality in people with coronary artery disease. Brain Sci. 2022;12(8):1070.
10. Musa S, Dergaa I, Bachiller V, Saad HB. Global implications of COVID-19 pandemic on adults' lifestyle behavior: the invisible pandemic of noncommunicable disease. Int J Prev Med. 2023;14:?
11. Foldes-Busque G, Dionne CE, Turcotte S, Tully PJ, Tremblay MA, Poirier P, Denis I. Epidemiology and prognostic implications of panic disorder and generalized anxiety disorder in patients with coronary artery disease: rationale and design for a longitudinal cohort study. BMC Cardiovasc Disord. 2021;21(1):1–9.
12. Patterson SL, Marcus M, Goetz M, Vaccarino V, Gooding HC. Depression and anxiety are associated with cardiovascular health in young adults. J Am Heart Assoc. 2022;11(24):e027610.
13. Zong XN, Xi B. Unhealthy lifestyle behaviors during pregnancy and offspring health risks at birth and early childhood. Healthy Lifestyle: From Pediatrics to Geriatrics. 2022;1–10.
14. Roohafza H, Noohi F, Hosseini SG, Alemzadeh-Ansari M, Bagherieh S, Marateb H, et al. A cardiovascular risk assessment model according to behavioral, psychosocial and traditional factors in patients with ST-segment elevation myocardial infarction (CRAS-MI): review of literature and methodology of a multi-center cohort study. Curr Probl Cardiol. 2022;101158.
15. Franklin BA, Rusia A, Haskin-Popp C, Tawney A. Chronic stress, exercise and cardiovascular disease: placing the benefits and risks of physical activity into perspective. Int J Environ Res Public Health. 2021;18(18):9922.
16. Salman A, Sigodo KO, Al-Ghadban F, Al-Lahou B, Alnashmi M, Hermassi S, Chun S. Effects of COVID-19 lockdown on physical activity and dietary behaviors in Kuwait: a cross-sectional study. Nutrients. 2021;13(7):2252.

17. Sapranaviciute-Zabazlajeva L, Sileikiene L, Luksiene D, Tamosiunas A, Radisauskas R, Milvidaite I, Bobak M. Lifestyle factors and psychological well-being: 10-year follow-up study in Lithuanian urban population. BMC Public Health. 2022;22(1):1011.
18. Xu L, Zimmermann M, Forkey H, Griffin J, Wilds C, Morgan WS, et al. How to mitigate risk of premature cardiovascular disease among children and adolescents with mental health conditions. Curr Atheroscler Rep. 2022;24(4):253–64.
19. Xu WQ, Tan WY, Li XL, Huang ZH, Zheng HR, Hou CL, et al. Prevalence and correlates of depressive and anxiety symptoms among adults in Guangdong Province of China: a population-based study. J Affect Disord. 2022;308:535–44.
20. Mattioli AV, Sciomer S, Maffei S, Gallina S. Lifestyle and stress management in women during COVID-19 pandemic: impact on cardiovascular risk burden. Am J Lifestyle Med. 2021;15(3):356–9.
21. Berk M, Köhler-Forsberg O, Turner M, Penninx BW, Wrobel A, Firth J, et al. Comorbidity between major depressive disorder and physical diseases: a comprehensive review of epidemiology, mechanisms and management. World Psychiatry. 2023;22(3):366–87.
22. Hu X, Wu M, Lin Y, Lin H, Hu Z. Risk factors for NCDs among life-cycle and practice of comprehensive intervention in China. 2022.
23. Sampogna G, Luciano M, Di Vincenzo M, Andriola I, D'Ambrosio E, Amore M, Niolu C. The complex interplay between physical activity and recovery styles in patients with severe mental disorders in a real-world multicentric study. Front Psychiatry. 2022;13:945650.
24. Li L, Ouyang F, He J, Qiu D, Luo D, Xiao S. Associations of socioeconomic status and healthy lifestyle with incidence of dyslipidemia: a prospective Chinese governmental employee cohort study. Front Public Health. 2022;10:878126.
25. Li L, Ouyang F, He J, Qiu D, Luo D, Xiao S. Associations of socioeconomic status and healthy lifestyle with incidence of dyslipidemia: a prospective Chinese governmental employee cohort study. Front Public Health. 2022;10:878126.
26. Krantz DS, Shank LM, Goodie JL. Post-traumatic stress disorder (PTSD) as a systemic disorder: pathways to cardiovascular disease. Health Psychol. 2022;41(10):651.
27. García-Esquinas E, Ortolá R, Giné-Vázquez I, Carnicero JA, Mañas A, Lara E, Rodríguez-Artalejo F. Changes in health behaviors, mental and physical health among older adults under severe lockdown restrictions during the COVID-19 pandemic in Spain. Int J Environ Res Public Health. 2021;18(13):7067.
28. Mathur K, Sharma S, Hussain MS. Disease and Diagnosis. 2023.
29. Liu X, Yuan Z, Ji Y. The association between electronic cigarettes, sleep duration, and the adverse cardiovascular outcomes: findings from Behavioral Risk Factor Surveillance System, 2020. Front Cardiovasc Med. 2022;9:909383.
30. Ghodeshwar GK, Dube A, Khobragade D, Dube AH. Impact of lifestyle modifications on cardiovascular health: a narrative review. Cureus. 2023 Jul 28;15(7).

31. Vaduganathan M, Mensah GA, Turco JV, Fuster V, Roth GA. The global burden of cardiovascular diseases and risk: a compass for future health. J Am Coll Cardiol. 2022;80(24):2361–71.
32. World Health Organization. Cardiovascular diseases (CVDs). Geneva: WHO; 2021.
33. Wurie HR, Cappuccio FP. Cardiovascular disease in low- and middle-income countries: an urgent priority. Ethn Health. 2012;17(6):543–50.
34. Centers for Disease Control and Prevention. Know your risk for heart disease. Atlanta: CDC; 2023.
35. Rippe JM. Lifestyle strategies for risk factor reduction, prevention, and treatment of cardiovascular disease. Am J Lifestyle Med. 2019;13(3):204–12.
36. Aggarwal M, Bozkurt B, Panjrath G, et al. Lifestyle modifications for preventing and treating heart failure. J Am Coll Cardiol. 2018;72(21):2391–405.