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**Original Research**

# Assessment of Atherosclerotic risk among United Arab Emirates Population: A Cross-Sectional Study

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**Abstract**

**Background:** Cardiovascular disease (CVD) continues to be a major health concern associated with a high mortality rate. Assessing atherosclerotic risk is a crucial role in preventing future cardiovascular disorders and halting disease progression. Patients at risk of cardiovascular development are recommended to implement lifestyle modifications and initiate appropriate pharmacologic therapies.

Objectives: The objectives are to assess the atherosclerotic cardiovascular disease risk (ASCVD) and evaluate the effect of the sociodemographic characteristics. **Methodology:** This was a cross-sectional study conducted between April and September 2023 through an online questionnaire distributed in hospital and community pharmacies via social media platforms. **Results:** A total of 440 participants were enrolled in the study, majority 85.5% were males within the age range of 40 to 59 years. Over a third of the participants (37.5%) were classified as having a low risk of developing atherosclerotic cardiovascular disease (ASCVD). In contrast, only 11.4% of the participants were found to have a high risk of developing ASCVD. An increase in the odds of ASCVD high risk category was significantly associated with increased age, income, being a smoker, and increased distress with a p-value <0.05. Conversely, being a female, working in the medical field, and receiving no Aspirin were significantly associated with lower odds of high risk ASCVD category with a p-value <0.05. **Conclusion:** Our study concluded that the majority of the participants had moderate to high ASCVD risk and the risk is higher with advanced age, smoking status, and increased distress level. Our study highlights the importance of initiating early medications and increasing awareness among patients.

**Keywords:** Atherosclerotic, cardiovascular disease risk, associated variables, sociodemographic characteristics



## INTRODUCTION

Cardiovascular disease (CVD) refers to a collection of illnesses that affect the heart and blood vessels triggering the development of hypertension, coronary heart disease, heart failure and other conditions[1-3]. CVD is a global health issue contributing significantly to an increased mortality rate worldwide[4]. Based on the World Health Organization report in 2019, it was estimated that around 17.9 million deaths were encountered accounting for a mortality rate of 32%[5]. In the United States, heart disease is the leading cause of mortality responsible for one death out in every five deaths[6]. It is projected that 40.8% of the US population will experience various forms of CVD which results in rises in healthcare costs – from $523 billion to an estimated $1.13 trillion[7]. Prevalence of CVD is triggered through modifiable and non-modifiable risk factors. Modifiable risk factors consist of controlling blood pressure, decreasing lipid levels, lowering blood glucose concentrations, aiding in smoking cessation, and achieving weight loss. On the other hand, non-modifiable risk factors include age, gender, ethnicity, and family history[8]. Cardiovascular diseases pose a threat, in the United Arab Emirates (UAE) accounting for 28% of all deaths in the country. This means that more than one in four individuals who pass away in the UAE are affected by CVDs. Previous studies showed a high prevalence of cardiovascular diseases risk factors among Emirati adults[9-11]. The risk factors for cardiovascular disease observed in the UAE are similar to those found in other countries. According to a study conducted in Saudi Arabia, unhealthy diet, smoking, dyslipidemia, and physical inactivity were prevalent risk factors for non-communicable diseases[8]. Raising community awareness through programs is essential to reduce the occurrence of cardiovascular diseases and their associated risk factors[12]. Research has indicated that individuals who possess knowledge about CVDs and the associated contributing factors are more inclined to take steps in preventing these conditions[8,12]. Thus, knowledge plays a significant role in promoting a healthy lifestyle as many CVDs can be prevented through primary and secondary preventive strategies[13]. Modifying risk factors such as smoking, obesity, physical inactivity, and hypertension as well as prescribing medications like anti-platelets and antihypertensives can prevent CVDs[13]. Effective education programs are essential to enhance awareness about the CVDs[8]. Extensive research has been conducted worldwide on the awareness of disease (CVD)

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and its associated risk factors. The findings reveal that levels of awareness vary among populations. Moreover, the awareness of risk factors also differs across populations. For instance, smoking is generally acknowledged as a risk factor for CVDs whereas awareness regarding blood pressure as a risk factor tends to be comparatively lower. Similar trends are observed for daily habits, physical inactivity and stress related factors with awareness being low even, in populations that are well informed about other CVD risk factors[12,14]. Thus, the objectives of this study are to assess the atherosclerotic cardiovascular disease risk and evaluate the effect of the associated variables as sociodemographic characteristics, distress level, physical activity, and health literacy among adults.

## MATERIALS AND METHODS

### Study design

A cross-sectional study was carried out from April to July 2023 during which data was systematically collected and analyzed to investigate the intended objectives of the study. It was conducted within hospital and community pharmacist in the United Arab Emirates. Data was collected through a survey administered in both English and Arabic languages to accommodate the linguistic diversity of the participants. Upon each patient's entry into the medical setting, the investigator personally approached patients, seeking their permission to participate in the survey.

### Sample size calculation

The Epi-info was used to calculate the required sample size, taking a confidence level of 95%, a risk of error of 5%, and knowing that the high risk of atherosclerosis is 51.0 % among women in Saudi Arabia, a minimal sample of 384 participants are needed. We collected 440 participants because we considered the possibility of invalid data[15]. These parameters were utilized to ensure that the study has an appropriate level of precision and can yield statistically significant results when investigating the relationship between distress scale values and varying atherosclerotic levels.

### Inclusion and exclusion criteria

Eligibility criteria included adults with an age range of 40 to 70 years, expressing willingness to take part in the survey, providing informed consent, and possessing the requisite cognitive abilities to comprehend and respond to the survey questions effectively. Patients who had a history of pre-existing cardiovascular disorders and were currently prescribed Aspirin for the management of any concurrent condition, as well as those who declined to participate in the study, were excluded from being part of the research sample.

### Questionnaire Setting (survey)

The data was gathered using an online questionnaire developed on Google Forms, comprising of eight sections. The survey was shared with eligible participants who met specific criteria. They could access it either through electronic device (i.e., iPad) that investigator provided or on their smartphones using the WhatsApp® app.

### Data Collection

The first section of the questionnaire primarily focused on gathering sociodemographic characteristics and the baseline Laboratory test (total cholesterol, High-Density Lipoprotein, Low-Density Lipoprotein, and blood pressure levels).

The second section comprised from the following scales:

### Eating Attitude Test Scale (EAT-7):

It is comprised of two types: **Items related to certain behaviors**, where participants rate the frequency of engagement on a six-point Likert scale, ranging from "Always=3" to "Never=0." **Behavioral items examining the frequency of disordered** eating behaviors over the past six months, rated on a six-point Likert scale from "Never=0" to "Once a day or more." For questions 1 to 7, responses are scored on a 4-point scale as follows: "Always" receives three points, "Usually" receives two points, " Mostly " receives one point, and "Sometimes," "Rarely," and "Never" receive zero points. The total score is calculated by summing all questions answers and can vary from 0 to 30. A score of 11 or above indicates possible disordered food attitudes.

### Beirut Distress Scale (BDS):

It included a total of 10-items to gauge the degree of mental and psychological distress using a 4-point Likert scale indicating the frequency of distress on a scale from 0 =never to 3=A lot frequently[16].

### Physical Activity Index:

This scale evaluates an individual's physical activity by considering the intensity, duration, and frequency of their physical activities. This scale focuses on three specific types of activities conducted in the mentioned contexts, along with the time spent sitting. These activities include walking, moderate-intensity exercise, and vigorous-intensity activities. The frequency of each activity (measured in days per week) and its duration (measured in hours per day) are collected separately for each type of activity[17].

### ASCVD risk assessment therapy:

It is assessed through an online calculation called "10-year ASCVD risk estimator plus" taking into account the following factors: age, gender, race, systolic and diastolic blood pressure, Lipid profile, smoking, history of diabetes, intake of lipid lowering medications, antiplatelets, and anti-hypertensives[18]. ASCVD risk score ranged from low risk (0 to less than 5%), borderline risk (5 to less than 7.5%), intermediate risk (7.5% to less than 20%) and high risk (above 20%).

### Statistical Analysis

The data collected from the 'Google Form' survey was analyzed using the Statistical Package for Social Sciences (IBM SPSS Statistics, Version 22.0, IBM Corp., Armonk, NY, USA). The data is presented as proportions and frequencies for categorical data and mean ± standard deviation (SD),

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or median and range for continuous data with normal and not normal distribution respectively. Chi-square or Fischer's exact test will be used to the assess the association between ASCVD risk category and categorical variables. For continuous variables, the student t-test will be employed. A *P*-value less than 0.05 will be considered statistically significant, indicating meaningful difference between variables. Logistic regression was performed to ascertain the effects of variables that demonstrated a significant association between variables and the ASCVD risk level.

## RESULTS

### Sociodemographic characteristics

A total of 440 patients were enrolled in the study with a mean age of 52.63 ± 7.67 (± standard deviation) with the majority being males, married, and wok in non-medical field 85.5%, 82.3%, and 94.6% respectively. Table 1 provides detailed information about the sociodemographic characteristics of the participants.

### Blood pressure measurement and Lipid profile

Table 2 presents the blood pressure measurements and lipid profiles of the participants. Almost around half of the participants had high blood pressure levels (130-139 mmHg and/or 80-89 mmHg). Regarding the lipid profile, 306 participants (69.1%) exhibited optimal LDL levels, while 331 participants (75.2%) reported medium HDL levels and 333 participants (75.7%) reported to have desirable HDL levels.

### Atherosclerotic Cardiovascular Disease Risk Categories

Figure 1 illustrates the ASCVD categories of the participants.

Table 1: Sociodemographic characteristics

| **Variables** | | **N (%)** |
|---|---|---|
| **Gender** | Female | 64 (14.5%) |
| | Male | 376(85.5%) |
| **Age (mean ± SD)** | 52.63 ± 7.67 | |
| **Age group (in years)** | 40 – 49 | 172(39.1%) |
| | 50 - 59 | 178(40.5%) |
| | 60 – 69 | 84 (19.1%) |
| | 70 - 79 | 6 (1.4%) |
| **Marital status** | Married | 362(82.3%) |
| | Single | 62 (14.1%) |
| | Widowed | 11 (2.5%) |
| | Divorced | 5 (1.1%) |
| **Body Mass Index category** | Normal 18 – 24.9 | 92 (20.9%) |
| | Overweight 25 – 29.9 | 319(72.5%) |
| | Obese 30 – 34.9 | 26 (5.9%) |
| | Morbidly obese > 35 | 3 (0.7%) |
| **Nationality** | India | 143(32.5%) |
| | UAE | 120(27.2%) |
| | Syria | 66 (15.0%) |
| | Pakistan | 25 (5.7%) |
| | Palestine | 25 (5.7%) |
| | Egypt | 22 (5.0%) |
| | Lebanese | 18 (4.1%) |
| | Jordan | 13 (2.9%) |
| | South Africa | 3 (0.7%) |
| | Others | 9 (2.0%) |
| **Educational level** | Intermediate | 53 (12.0%) |
| | Secondary | 282(64.1%) |
| | University | 105(23.9%) |
| **Work Type** | Non-medical | 417(94.6%) |
| | Medical | 23 (5.2%) |


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| | | |
|---|---|---|
| **Employment Status** | Employed | 333(75.7%) |
| | Unemployed | 51 (11.6%) |
| | Retired | 56 (12.7%) |
| **Monthly Income (in UAE Dirhams)** | None | 84 (19.1%) |
| | < 5000 | 83 (18.9%) |
| | 5000 - 9999 | 76 (17.3%) |
| | 10000 – 15000 | 68 (15.5%) |
| | >15000 | 129(29.3%) |
| **Smoking Status** | Current | 283(64.3%) |
| | Former | 85 (19.3%) |
| | Never | 72 (16.4%) |
| **Insurance coverage** | Yes | 407(92.5%) |
| | No | 33 (7.5%) |
| **Previous surgery** | Yes | 66 (15.0%) |
| | No | 374(85.0%) |
| **Family members diagnosed with a cardiovascular disease** | Yes | 98 (22.3%) |
| | No | 342(77.7%) |
| House Crowding Index mean (±SD) | 2.01 (±1.07) | |
| **PAI activity Levels N (%)** | | |
| Inactive (< 20% of the scores) | 407 (92.5%) | |
| Moderately inactive (20–40% of the scores) | 25 (5.7%) | |
| Active (60–90% of the scores) | 6 (1.4%) | |
| Very active (>90% of the scores) | 0 (0%) | |
| Physical Activity Index (Mean ± SD) * * | **4.87 (±2.13)** | |

Table 2: Blood Pressure Measurement and Lipid Profile

| Measurement | **Level (normal values based on AHA Guidelines)** | | **N (%)** |
|---|---|---|---|
| Blood pressure measurement | Normal < 120 mmHg and < 80 mmHg | | 6 (1.4%) |
| | Elevated 120-129 mmHg and < 80 mmHg | | 8 (1.8%) |
| | High blood pressure STAGE 1 130-139 mmHg or 80-89 90mmHg | | **216 (49.1%)** |
| | High blood pressure 140 or higher or ³ 90 mmHg | | 210 (47.7%) |
| Lipid profile | LDL level | Optimal (< 100 mg/dL) | **304 (69.1%)** |
| | | Near optimal (100-129 mg/dL) | 35 (8.0%) |
| | | Borderline high (130 - 159 mg/dL) | 22 (5.0%) |
| | | High (160-189 mg/dL) | 78 (17.7%) |
| | | Very high (³190 mg/dL) | 1 (0.2%) |
| | Total cholesterol level | Desirable (< 200 mg/dL) | **333 (75.7%)** |
| | | Borderline (200 - 239 mg/dL) | 107 (24.3%) |
| | | High (³ 240 mg/dL) | 0 |
| | HDL level | Low (men < 40 mg/dL and women <50 mg/dL) | 100 (22.7%) |
| | | Medium (men = 40 – 59 mg/dL and women 50 – 59 mg/dL) | **331 (75.2%)** |
| | | High ³ 60 mg/dL | 9 (2.0%) |

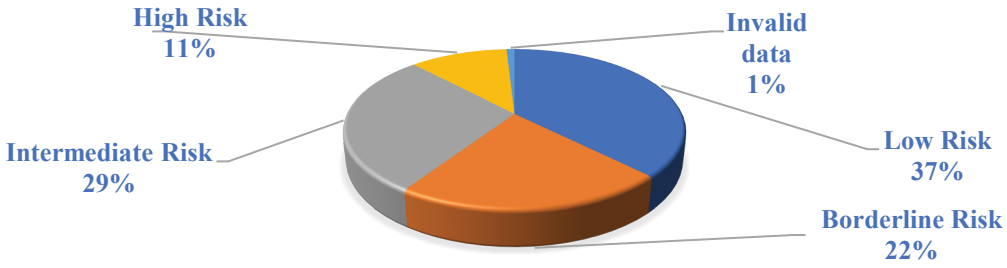


**Figure 1.** Distribution of Atherosclerotic Cardiovascular Disease (ASCVD) Categories among Participants (n=440)

Over a third of the participants (37.5%) were classified as having a low risk of developing atherosclerotic cardiovascular disease (ASCVD). In contrast, only 11.4% of the participants were found to have a high risk of developing ASCVD.

### Bivariate analysis

A higher percentage of high risk ASCVD category was observed in patients with age range category 70-79 years. Females also had greater percentage of low-risk category compared to males. A higher percentage of patients who were retired had high risk ASCVD risk category compared to employed and unemployed. Higher percentage of high risk ASCVD category was observed in patients who were working in non-medical field compared to medical (Table 3).

### Multivariable analysis

Table 4 presents the logistic regression analysis of the final model. An increase in the odds of ASCVD high risk category was significantly associated with increased age, income, being a smoker, and increased distress with a p-value <0.05. Conversely, being a female, working in the medical field, and receiving no Aspirin were significantly associated with lower odds of high risk ASCVD category with a p-value <0.05.

## DISCUSSION

To achieve the research objective, we conducted a comprehensive data collection and analysis process. We

Table 3: Sociodemographic characteristics and ASCVD Groups Crosstabulation

| | | ASCVD Groups | | | | P-Value |
|---|---|---|---|---|---|---|
| | | Low risk | Border Line | Intermediate | High Risk | |
| Age Groups | 40 - 49 | 132 (77.2) | 18 (10.5) | 17 (9.9) | 4 (2.3) | <0.001 |
| | 50 - 59 | 30 (16.9) | 74 (41.6) | 53 (29.8) | 21 (11.8) | |
| | 60 - 69 | 3 (3.7) | 4 (4.9) | 52 (64.2) | 22 (27.2) | |
| | 70 - 79 | 0 | 0 | 4 (66.7) | 2 (33.3) | |
| Gender | Female | 49(77.8) | 8 (12.7) | 6 (9.5) | 0 | <0.001 |
| | Male | 116(31.1) | 88(23.6) | 120(32.2) | 49(13.1) | |
| Obesity | Morbidity obese | 1(50) | 0 | 0 | 1(50) | 0.15 |
| | Normal | 25(27.8) | 28(31.1) | 28(31.1) | 9(10) | |
| | Obese | 9(36) | 5(20) | 6(24) | 5(20) | |
| | Overweight | 130(40.8) | 63(19.7) | 92(28.8) | 34(10.7) | |
| Marital status | Divorced | 0 | 1(20) | 2(40) | 2(40) | 0.08 |
| | Married | 127(35.4) | 84(23.4) | 111(30.9) | 37(10.3) | |
| | Single | 34(55.7) | 11(18) | 8(13.1) | 8(13.1) | |
| | Widowed | 4(36.4) | 0 | 5(45.5) | 2(18.2) | |
| Nationality | Arab | 110(42) | 46(17.6) | 78(29.8) | 28(10.7) | 0.16 |
| | Indian | 43(30.3) | 41(28.9) | 41(28.9) | 17(12) | |
| | Others | 3(75) | 1(25) | 0 | 0 | |
| | Pakistan | 8(32) | 6(24) | 7(28) | 4(16) | |
| | South Africa | 1(33.3) | 2(66.7) | 0 | 0 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Employment status | Employed | 132(40) | 90(27.3) | 79(23.9) | 29(8.8) | <0.001 |
| | Retired | 1(1.8) | 1(1.8) | 35(63.6) | 18(32.7) | |
| | Unemployed | 32(62.7) | 5(9.8) | 12(23.5) | 2(3.9) | |
| Work type | Medical | 15 (71.4%) | 4 (19.0%) | 1 (4.8%) | 1 (4.8%) | 0.008 |
| | Non-medical | 150 (36.1%) | 92 (22.2%) | 125 (30.1%) | 48 (11.6%) | |
| Educational level | Intermediate | 12(22.6) | 8(15.1) | 26(49.1) | 7(13.2) | <0.001 |
| | Secondary | 99(35.2) | 74(26.3) | 76(27) | 32(11.4) | |
| | University | 54(52.9) | 14(13.7) | 24(23.5) | 10(9.8) | |
| Monthly Income | <5000 dirham | 30(37) | 38(46.9) | 12(14.8) | 1(1.2) | <0.001 |
| | >15000 dirham | 58(45.3) | 34(26.6) | 26(20.3) | 10(7.8) | |
| | 10000 dirhams | 27(39.7) | 6(8.8) | 27(39.7) | 8(11.8) | |
| | 6000-8000 dirham | 22(28.9) | 12(15.8) | 26(34.2) | 16(21.1) | |
| | None | 28(33.7) | 6(7.2) | 35(42.2) | 14(16.9) | |
| Current smoking cigarette status | Current | 95(33.7) | 81(28.7) | 72(25.5) | 34(12.1) | <0.001 |
| | Former | 26(30.6) | 7(8.2) | 41(48.2) | 11(12.9) | |
| | Never | 44(63,8) | 8(11.6) | 13(18.8) | 4(5.8) | |
| Insurance coverage | No | 18(56.3) | 6(18.8) | 4(12.5) | 4(12.5) | 0.089 |
| | Yes | 147(36.4) | 90(22.3) | 122(30.2) | 45(11.1) | |
| Surgery history | No | 153(41) | 92(24.7) | 92(24.7) | 36(9.7) | <0.001 |
| | Yes | 12(19) | 4(6.3) | 34(54) | 13(20.6) | |
| Intake of Aspirin | No | 160(49.2) | 85(26.2) | 62(19.1) | 18(5.5) | <0.001 |
| | Yes | 5(4.5) | 11(9.9) | 64(57.7) | 31(27.9) | |

Table 4: Regression analysis. Between social demographic characteristics and ASCVD categories (low-intermediate-high-borderline).

| Predictors | Odds Ratio | 95% Confidence Interval | | P-value |
|---|---|---|---|---|
| | | Lower | Upper | |
| **Age Groups (Reference 40- 49)** | | | | |
| 50 - 59 | 7.23 | 3.15 | 16.57 | <0.001 |
| 60 - 69 | 86.55 | 12.11 | 618.74 | <0.001 |
| 70 - 79 | 45.08 | 2.56 | 794.56 | <0.001 |
| **Gender (Female)** | 0.01 | 0 | 0.06 | <0.001 |
| **Work type (Medical)** | 0.02 | 0 | 0.41 | <0.001 |
| **Monthly Income (None as reference)** | | | | <0.001 |
| <5000 di | 1.1 | 0.1 | 11.9 | 0.94 |
| >15000 d | 2.03 | 0.21 | 19.85 | 0.54 |
| 10000 di | 13.7 | 1.26 | 148.93 | 0.03 |
| 6000-8000 | 8.89 | 0.86 | 91.87 | 0.07 |
| **Smoking cigarette (Never as Reference)** | | | | 0.02 |
| Current | 5.15 | 1.29 | 20.54 | 0.02 |
| Former | 1.7 | 0.37 | 7.79 | 0.49 |
| **Distress Scale** | 1.18 | 1.08 | 1.29 | <0.001 |
| **Intake of Aspirin (No)** | 0.08 | 0.02 | 0.25 | <0.001 |

gathered socio-demographic data from the participants to gain insights into their background and characteristics. Understanding the sociodemographic profile of the study population is crucial as it can influence in assessing the ASCVD levels, health behaviors, and access to healthcare services. Additionally, we assessed eating attitudes, stress levels, and physical activity levels of the participants, as these factors are known to be closely linked to cardiovascular health.

Poor eating habits, high stress levels, and sedentary lifestyles are recognized risk factors for CVD and addressing them can contribute to better cardiovascular outcomes. Moreover, we measured the health literacy of the participants, as health literacy plays a critical role in understanding and managing cardiovascular risk factors and preventive measures. Individuals with higher health literacy levels are more likely to make informed decisions about their health. Furthermore, we collected and analyzed blood pressure measurements and lipid profiles of the participants. Elevated blood pressure and abnormal lipid levels are well-established risk factors for CVD. Understanding the prevalence of these risk factors among the study population can inform targeted interventions and management strategies.

**Sociodemographic Characteristics**

The participant's sociodemographic details provided insights, into the demographics of the people included in the study. A

significant proportion of the participants were men (85.5%). Their average age was 52.63 years with a notable number falling into the age groups of 40 to 49 and 50 to 59. Most of them were married (82.3%). Had completed education (64.1%). The majority of the participants were overweight (72.5%). The study mainly consisted of medical professionals (94.6%) who were currently employed (75.7%). Additionally, a large majority had insurance coverage (92.5%). These sociodemographic characteristics play a role in understanding how representative the study population is and any potential connections, to risk factors[19].

**Blood Pressure Measurement and Lipid Profile**

The findings, from the measurement of blood pressure and lipid profiles provided insights into the risk factors among the participants. It was observed that more than half of the participants had higher than blood pressure levels (≥ 130 mmHg and/or ≥ 90 mmHg) and around 18% had high levels of LDL between 160-189 mg/dL. Elevated LDL cholesterol is widely recognized as a risk factor for atherosclerosis which's a leading cause of disease. These results emphasize the importance of targeted interventions that focus on managing hypertension and dyslipidemia through lifestyle changes and appropriate medication. These findings indicate a prevalence of hypertension and dyslipidemia both known risk factors, for cardiovascular disease[20,21].

**ASCVD Categories of the Participants**

Among the participants it was observed that a significant portion of them were categorized as having a risk of developing cardiovascular disease (37.5%). However, it is worrisome that only a small percentage (11.4%) were identified as having a risk of developing ASCVD. These results highlight the importance of intensifying efforts to identify and manage individuals who are at risk for cardiovascular diseases in order to prevent any negative cardiovascular events [22,23].

**Eating Attitude Test (EAT-7)**

The results, from the Eating Attitude Test (EAT 7) offer insights into how disordered eating attitudes are among the participants in the study and whether they might be linked to cardiovascular health. The findings indicate that only a small number of participants showed scores on the EAT 7 suggesting a risk of having an eating disorder. This implies that disordered eating attitudes may not be widely prevalent in this group of people and may have limited impact on their well-being.

**Beirut Distress Scale**

The data obtained from the Beirut Distress Scale (BDS) indicated that only a small proportion of participants reported higher scores, indicating significant psychological distress. Most participants (92.0%) reported no or minimal distress. However, a notable portion (7.6%) experienced significant psychological distress. However, a large proportion of participants recorded at least one score on the scale, suggesting a considerable prevalence of psychological distress among the study population.

**Physical Activity Index**

According to the findings of the Physical Activity Index (PAI) most of the participants were not very active or only moderately active. Only a small percentage of participants were considered "active " suggesting that the study population has levels of activity. The PAI results revealed that a majority of participants (92.5%) were classified as inactive while 5.7% were moderately inactive.

**Limitations**

This study had some limitations which are sampling and recall bias since the study was conducted on a specific population within the United Arab Emirates, which may not represent the entire population's diversity and characteristics. This sampling bias could impact the generalizability of the findings. Furthermore, since the participants had to self-report data related to lifestyle behaviors which may be subjected to recall bias and social desirability bias leading to potential inaccuracies in the responses.

## CONCLUSION

This study concluded that the majority of the patients had moderate and high ASCVD risk. Our study concluded that ASCVD risk was higher with increased age, smoking, and increased distress. We recommend utilization of objective measures, such as medical records and physical assessments, in addition to self-reported data, to obtain more accurate information on medication adherence and lifestyle behaviors. Future research should include a more diverse and representative sample of the population to enhance the generalizability of findings. We recommend implementation of educational programs to increase awareness among patients about cardiovascular disease risk factors and the benefits of preventive measures.

## AUTHORS' CONTRIBUTIONS

Conceptualization, D.M.; methodology, D.M.; validation, D.M.; formal analysis, I.H., D.M.; investigation, D.M.; data curation, I.H., D.M.; writing—original draft preparation, I.H.; writing—review and editing, I.H; supervision, D.M.; project administration, I.H. All authors have read and agreed to the published version of the manuscript.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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