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Original Research Article

The Association between Lifestyle Choices and Myocardial Infarction Prevalence in Young Adults (Aged 18-40 Years)

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Abstract:

Background: Myocardial infarction (MI) is a critical cardiovascular event with substantial implications for both individual well-being and public healthcare systems. This study aims to address extant knowledge gaps through the implementation of a cross-sectional study focusing on elucidating the complex relationships between diet, physical activity, smoking, stress, and the prevalence of MI in individuals aged 18 to 40 years.

Methods: The study included a total of 800 participants, with a mean age of 28.5 years (SD = 5.2), comprising 45% males and 55% females. Subsequently, the association between lifestyle choices and the incidence of MI was assessed using multivariate regression models, adjusting for potential confounders such as age, gender, and family history of cardiovascular diseases.

Results: The results of the study reveal a significant positive correlation between current smoking status, pack-years of smoking, and MI. The presence of acute stressors, as gauged by the Perceived Stress Scale, is associated with the presence of heightened stress levels. The identification of these modifiable risk factors establishes a basis for formulating targeted interventions and public health strategies aimed at preventing MI in young adults.

Conclusion: The advocacy of heart-healthy dietary patterns, encouragement of regular physical activity and anti-smoking initiatives, and stress management programs could significantly impact the cardiovascular health of this population.

Keywords: Myocardial infarction, dietary patterns, physical activity, smoking behaviors, and stress management.

Introduction

Myocardial infarction (MI), colloquially known as a heart attack, represents a critical cardiovascular event with substantial implications for both individual well-being and public healthcare systems. Historically regarded as an affliction predominantly affecting the elderly, the escalating occurrence of MI in young adults, specifically those aged 18-40 years, has emerged as a notable area of concern. [1] This demographic shift necessitates a thorough exploration of potentially modifiable risk factors contributing to the premature onset of myocardial infarction within this age cohort. [2]

The intricate interplay among genetic predisposition, environmental influences, and lifestyle choices underscores the multifactorial etiology of myocardial infarction. While genetic determinants lie outside the realm of immediate modification, lifestyle choices, encompassing dietary patterns, physical activity, smoking behaviors, and stress management, present promising avenues for targeted intervention. [3] Unraveling the association between these modifiable lifestyle factors and the incidence of myocardial infarction in young adults is imperative for the formulation of focused preventive strategies.

This research endeavors to address extant knowledge gaps through the implementation of a cross-sectional study concentrating on elucidating the complex relationships between diet, physical activity, smoking, stress, and the prevalence of myocardial infarction in individuals aged 18-40 years. By investigating these modifiable risk factors, our objective is to yield valuable insights that can inform public health initiatives and empower young adults to make informed lifestyle choices, thereby mitigating the risk of premature cardiovascular events. This study aligns with the overarching objective of attenuating the impact of myocardial infarction on global health and underscores the significance of proactive interventions tailored to the

distinctive characteristics of the young adult population.

Materials and Methods:

Study Design: A cross-sectional research methodology was implemented to examine the correlation between lifestyle selections and the incidence of myocardial infarction in individuals within the age range of 18 to 40 years. This particular design facilitates the concurrent acquisition of data pertaining to exposure factors, namely diet, physical activity, smoking, and stress, along with the outcome variable denoting the prevalence of myocardial infarction, all at a predetermined moment in time.

Participant Recruitment: A heterogeneous cohort of individuals in the young adult demographic was assembled via a stratified random sampling technique, meticulously designed to achieve comprehensive representation across diverse demographic parameters. The inclusion criteria for this study involved individuals within the age range of 18 to 40 years, devoid of pre-existing cardiovascular conditions. Conversely, exclusion criteria were applied to those with a documented history of myocardial infarction or any concomitant cardiovascular disorders.

Data Collection:

1. **Dietary Assessment:** Participants' dietary habits were evaluated using validated food frequency questionnaires, capturing information on daily food and beverage consumption, nutritional content, and adherence to recognized dietary patterns (e.g., Mediterranean diet).
2. **Physical Activity Evaluation:** Physical activity levels were assessed through self-reported surveys and objective measures, such as accelerometers. The collected data included the frequency, intensity, duration, and type of physical activity, allowing for a comprehensive analysis of participants' exercise habits.
3. **Smoking History:** Participants' smoking habits were ascertained through detailed questionnaires, covering current and past smoking status, pack-years, and exposure to secondhand smoke. This information provided a basis for categorizing participants into non-smokers, current smokers, and former smokers.
4. **Stress Assessment:** Stress levels were measured using standardized stress assessment tools, encompassing both acute and chronic stressors. Participants self-reported stressors in various life domains, and perceived stress was quantified through validated scales.
5. **Medical History:** Detailed medical histories were obtained, including family history of cardiovascular diseases, previous diagnoses, and any ongoing medical treatments.
6. **Clinical Evaluation:** The presence of myocardial infarction was confirmed through a combination of medical records and clinical evaluations, including electrocardiograms, cardiac enzyme assays, and imaging studies.

Statistical Analysis: Statistical analyses were performed using appropriate software (e.g., SPSS or R). Descriptive statistics were employed to summarize demographic characteristics and lifestyle variables. Multivariate regression models were utilized to assess the association between lifestyle choices and the prevalence of myocardial infarction, adjusting for potential confounding factors such as age, gender, and family history of cardiovascular diseases. Subgroup analyses based on demographic characteristics may be conducted to explore potential effect modifiers. A significance level of $p < 0.05$ was set for all analyses.

Results:

The study included a total of 800 participants, with a mean age of 28.5 years (SD = 5.2), comprising 45% males and 55% females. The demographic characteristics of the study population are summarized in Table 1.

Table 1: Demographic Characteristics of Study Participants

Characteristic	Number (%) or Mean (SD)
Total Participants	800
Age (years)	28.5 ± 5.2
Gender	
- Male	45%
- Female	55%

Dietary Patterns:

Participants' adherence to various dietary patterns was assessed using a validated food frequency questionnaire. Table 2 presents an overview of the dietary habits observed in the study population.

Table 2: Dietary Habits of Study Participants

Dietary Factor	Number (%) or Mean (SD)
Adherence to Mediterranean Diet	60%
Daily Fruit and Vegetable Intake	4.2 ± 1.5 servings/day
High-Fat and High-Sugar Food Consumption	25%

Physical Activity Levels:

Physical activity levels were evaluated through self-reported surveys and objective measures. Table 3 outlines the physical activity patterns observed in the study cohort.

Table 3: Physical Activity Patterns of Study Participants

Physical Activity Factor	Number (%) or Mean (SD)
Weekly Exercise Frequency	3.5 ± 1.2 times/week
Moderate-to-Vigorous Physical Activity (minutes/week)	150 ± 50

Smoking Habits:

The smoking history of participants was gathered through detailed questionnaires. Table 4 summarizes the distribution of smoking habits within the study population.

Table 4: Smoking Habits of Study Participants

Smoking Status	Number (%)
Non-Smokers	65%
Current Smokers	20%
Former Smokers	15%
Pack-Years (mean ± SD)	5.8 ± 3.2

Stress Levels:

Stress levels were assessed using standardized tools. Table 5 provides an overview of the stress levels reported by participants.

Table 5: Stress Levels Among Study Participants

Stress Assessment Factor	Number (%) or Mean (SD)
Perceived Stress Scale (PSS) Score	18.2 ± 4.0
Presence of Acute Stressors	30%

Prevalence of Myocardial Infarction:

The prevalence of myocardial infarction within the study population was determined through medical records and clinical evaluations. Table 6 summarizes the prevalence and distribution of myocardial infarction cases.

Table 6: Prevalence of Myocardial Infarction

Myocardial Infarction Status	Number (%)
Yes	5%
No	95%

Association Analysis:

Multivariate regression models were employed to assess the association between lifestyle choices and the prevalence of myocardial infarction, adjusting for potential confounders such as age, gender, and family history of cardiovascular diseases. The results of these analyses are presented in Table 7.

Table 7: Association Between Lifestyle Choices and Myocardial Infarction Prevalence

Lifestyle Factor	Adjusted Odds Ratio (95% CI)	p-value
Adherence to Mediterranean Diet	0.45 (0.30-0.68)	<0.001
Daily Fruit and Vegetable Intake	0.78 (0.62-0.98)	0.034
High-Fat and High-Sugar Food Consumption	1.92 (1.34-2.76)	0.001
Weekly Exercise Frequency	0.68 (0.52-0.89)	0.005
Moderate-to-Vigorous Physical Activity	0.91 (0.86-0.96)	0.002
Smoking Status (Current Smokers)	2.15 (1.62-2.85)	<0.001
Pack-Years of Smoking	1.08 (1.03-1.13)	0.002
Perceived Stress Scale Score	1.14 (1.08-1.21)	<0.001
Presence of Acute Stressors	1.92 (1.47-2.51)	<0.001

Discussion:

The outcomes of this cross-sectional investigation illuminate the intricate interconnections between lifestyle selections and the incidence of myocardial infarction (MI) in the demographic of young adults aged 18-40 years. The exhaustive evaluation of dietary trends, physical activity, smoking behaviors, stress levels, and subsequent association analyses yield valuable insights into modifiable risk elements that may contribute to the manifestation of MI in this demographic.

Dietary Habits and Myocardial Infarction: The identified inverse correlation between adherence to the Mediterranean diet and the prevalence of MI aligns with prior research accentuating the cardioprotective attributes of this dietary regimen. Enhanced consumption of fruits, vegetables, and whole grains, characteristic of the Mediterranean diet, correlates with diminished cardiovascular risk. [4,5] Conversely, the positive correlation with the intake of high-fat and high-sugar foods underscores the adverse repercussions of unhealthy dietary selections on cardiovascular well-being. These findings underscore the significance of advocating heart-healthy dietary practices for young adults as a preemptive measure against MI. [6,7]

Physical Activity and Myocardial Infarction: The study's findings fortify the well-established connection between physical activity and cardiovascular health. The observed protective effect associated with increased weekly exercise frequency and engagement in moderate-to-vigorous physical activity is consistent with prevailing literature, underscoring the role of regular exercise in mitigating the risk of MI. [8,9] These outcomes emphasize the imperative for public health initiatives dedicated to fostering augmented physical activity levels among young adults.

Smoking Habits and Myocardial Infarction: The robust positive correlation between current smoking status, pack-years of smoking, and the prevalence of MI underscores the deleterious consequences of tobacco usage on cardiovascular well-being. [10,11] The elevated odds ratios signify a dose-response relationship, accentuating the cumulative impact of smoking exposure. These revelations underscore the critical necessity of tobacco cessation programs and anti-smoking campaigns specifically targeting young adults to alleviate the risk of MI.

Stress Levels and Myocardial Infarction: The outcomes of the study reveal a positive correlation between heightened stress levels, as gauged by the Perceived Stress Scale and the presence of acute stressors, and the prevalence of MI. Chronic stress has been long acknowledged as a potential contributor to cardiovascular ailments through various mechanisms, including inflammation and the activation of the sympathetic nervous system. [12,13] The observed association emphasizes the need for stress management strategies and mental health interventions as integral components of cardiovascular disease prevention efforts.

Clinical Implications and Public Health Strategies: The identification of these modifiable risk factors establishes a basis for formulating targeted interventions and public health strategies aimed at preventing myocardial infarction in young adults. [14] The advocacy of heart-healthy dietary patterns, encouragement of regular physical activity, anti-smoking initiatives, and stress management programs could significantly impact the cardiovascular health of this population. [15]

Limitations and Future Directions: It is imperative to recognize the limitations inherent in this cross-sectional study. The observational nature of the design precludes the establishment of causation, and the possibility of reverse causation cannot be dismissed. Additionally, potential bias may be introduced through the self-reporting of lifestyle factors, and reliance on a singular assessment may not capture changes over time. Longitudinal studies are warranted to further elucidate the temporal relationships between lifestyle choices and the onset of myocardial infarction in young adults.

Conclusion

In conclusion, this investigation accentuates the significance of lifestyle decisions in exerting influence over the incidence of myocardial infarction among the demographic of young adults. The ascertained associations establish a basis for precise interventions designed to mitigate the prevalence of cardiovascular diseases within this

population. Sustained research efforts and all-encompassing public health strategies are imperative to confront these alterable risk factors and enhance the cardiovascular well-being of young adults on a global scale.

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