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Patient Awareness of Peripheral Artery Disease and Its Risk Factors: A Quantitative Study in Jordan

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ABSTRACT

This study addresses patients' awareness of PAD, or peripheral artery disease, and its related risk factors, such as diabetes, smoking, high cholesterol, and high blood pressure, which are factors that contribute significantly to the development of the disease. The study aims to measure the level of knowledge of patients in Jordan about this disease, and to study the impact of health awareness on prevention and early diagnosis. By reviewing previous studies, it was found that there is a global and regional lack of awareness of PAD, as many studies in developed countries have shown that less than a third of patients are aware of their condition. In developing countries, including Jordan, research on this topic is limited. The study uses a questionnaire tool based on a three-point Likert scale to measure patients' knowledge, attitudes, and health practices related to the disease. The study's findings demonstrated that the degree of awareness of participants about PAD was generally average, with differences in knowledge, attitudes, and health practices among participants. The results highlighted the importance of increasing awareness of the risks and factors affecting the disease and encouraging preventive health practices.

Keywords: *Peripheral artery disease, Vascular, Jordan.*

INTRODUCTION

Peripheral artery disease (PAD) is a common disease affecting the circulatory system, as it occurs because of blockage or narrowing among the blood-supplying arteries to the extremities, especially the legs [1]. It is a common artery-narrowing vascular disease that causes blood flow problems, presents as intermittent claudication, a discomfort or cramping sensation caused by physical activity or walking [2], and is often caused by atherosclerosis caused by the accumulation of fatty deposits on the walls of the blood vessels, leading to a deficit in blood flow [3]. Smoking, diabetes, high blood pressure, high cholesterol, hyperlipidemia, family history, and a sedentary way of living are some of the most prominent risk factors that increase the likelihood of developing the disease. [4][2][1] Increased obesity (obesity paradox) [5], advanced age, and the burden of comorbidities [6] are among the most prominent risk factors that increase the likelihood of developing the disease. However, lack of knowledge and awareness about these factors may lead to delayed diagnosis and treatment, increasing the risk of serious complications, such as intermittent claudication, [7] muscle wasting, [8] [9] and hypoxia during exercise. [10][7] The risk of diabetic foot ulcers and gangrene, [4] or even amputation, [6] [3] and the risk of cancer, [11] [12] and higher rates of adverse events in the hospital, and increased mortality. [6][13][14][9] The survival rate for was worse for patients with up to eight years of peripheral arterial stenosis[1] .

Patient awareness affects the perception and understanding of knowledge gaps in the disease and contributes to the development of a targeted and effective health education strategy. By improving knowledge about the disease, prevention behaviors can be promoted and risk factors related to it can be reduced, thus improving public health and reducing the health burden on society. As PAD is an age-related condition, its prevalence is increasing due to the increasing number of elderly populations worldwide [1]. Previous studies show knowledge gaps at the global and regional levels in the extent of patients' awareness about PAD and its associated risk factors, especially in developing countries, including Jordan.

According to a regional pilot study on community-based peripheral artery disease screening, patients' knowledge of the diagnosis of PAD was inadequate and linked to a lower risk factor for atherosclerosis [15]. In the Netherlands, Both populations' awareness of exercise therapy was mediocre, but their understanding of quitting smoking was poor. The broader public was unaware of the crucial role that GPs in the management of PAD [16]. A study in New Zealand found that awareness of the risks of PAD was poor [17], in Ireland showed a worrying PAD ignorance and emphasizes the necessity of a focused and significant public health education program to close the knowledge gap among Irish patients [18].

In addition, a study conducted in the United Kingdom showed poor awareness of patients about risk factors [19], an international study conducted in nine Latin American, North American, and European nations showed low self-reported awareness of PAD [20]. In the United States, patients with PAD suffer from a lack of awareness of this diagnosis and general knowledge about these diseases [21]. In Jordan, a study was conducted that showed a relatively high prevalence of asymptomatic PAD in diabetic foot patients. Significant associations between PAD and male sex, previous smoking, cerebrovascular disease, age, duration of diabetes, high-density lipoprotein (HDL) cholesterol. Only smoking and hypertension were significant results [22].

This study aims to measure the level of awareness of patients about peripheral artery disease and its associated risk factors by focusing on Jordan as a research community, a country characterized by its demographic and geographical diversity, which allows for measuring health awareness in a more comprehensive manner. It also seeks to shed light on the challenges facing health awareness, especially in a society characterized by a large disparity in education levels and health awareness.

This study highlights the importance of health education as a key factor in the prevention of chronic diseases, as its results contribute to preparing and designing recommendations to enhance health awareness programs and prepare campaigns targeting the groups most vulnerable to peripheral artery disease, working to enhance early diagnosis and reduce the need for complex surgical medical procedures, and enhance prevention and treatment practices in Jordan, thus reducing the health and economic burden on the health system.

Methods

Study Design

The Institutional Review Board of Al-Balqa Applied University accepted the procedure. Each participant gave written informed consent before they began the survey.

Criteria for inclusion and recruitment

Patients from outpatient clinics at Al-Hussein New Salt Hospital - Salt - Jordan, aged 18 years and older. The sample was randomly selected to ensure comprehensive and accurate representation .This study was conducted in January 2025.

Participants' Awareness Measures

A questionnaire was developed in Arabic consisting of (4) sections: demographic information (age, gender, and educational level), level of knowledge about peripheral artery disease (6) items, attitudes toward prevention and treatment (5) items, and health practices associated with the disease (4) items. The survey was created with input from national specialists in health education or peripheral artery disease, and it was evaluated in a small sample of patients with peripheral artery disease.

For each knowledge item, the degree of knowledge was determined according to a three-way Likert scale (agree, neutral, disagree). Weights were given (1 agree, 2 neutral, 3 disagree), and the arithmetic mean was calculated as follows:

Direction of opinion for a three-way Likert scale		
direction of opinion	Average	Level of importance
agree	From 2.34 to 3	High
neutral	From 1.67 to 2.33	middle
disagree	From 1 to 1.66	Low

Statistical analysis

The analysis was conducted using SPSS V.22, and the demographic information of the study sample was presented using descriptive statistical measures, frequencies, and percentages for categorical data.

If the questionnaire's questions measure the things they were intended to test, it is said to have construct validity. The purpose of the construct validity test is to ensure that each item in the questionnaire is related to the item to which it belongs and that all fields within the same axis are related to each other. Pearson's correlation coefficient was extracted for this purpose as shown in Table 1

Table 1: Pearson's coefficient of the instrument

field	item	coefficient of correlation on the axis	The field's correlation coefficient
knowledge about peripheral artery disease	1	.881**	.794**
	2	.733**	.855**
	3	.737**	.853**
	4	.727**	.818**
	5	.783**	.744**
	6	.727**	.807**
Attitudes towards prevention and treatment	7	.727**	.796**
	8	.881**	.794**
	9	.734**	.874**
	10	.889**	.753**
	11	.783**	.795**
Health practices associated with the disease	12	.791**	.758**
	13	.755**	.790**
	14	.785**	.808**
	15	.876**	.804**

The table above makes it evident that the paragraphs' correlation coefficients on their primary domains and the tool's overall axis are both statistically significant and positive at the 0.001 significance level. As a result, the correlation coefficient (Pearson) indicates that the tool's architecture is valid and appropriate for the study's objectives.

Stability of the questionnaire:

By using the SPSS software to calculate the Cronbach's alpha value, which is considered statistically acceptable if the coefficient value is larger than or equal to (0.60) [23], and the questionnaire's stability as a tool for measuring the variables was confirmed. The more stable the questionnaire, the closer the value is to (1), or 100%. The questionnaire fields have a very high Cronbach's alpha (generic stability coefficient), according to the results displayed in Table (2), reaching (0.900) for the total paragraphs; this means that the (form) offers a high level of stability and is dependable for the study's field application.

Table 2: The overall stability coefficient of the tool

field	Number of items	(Cronbach alpha)
knowledge about peripheral artery disease	6	.769
Attitudes towards prevention and treatment	5	.779
Health practices associated with the disease	4	.900

Results and discussion

Table 3: An explanation of the study sample's demographic features

variable	Type	the number	percentage %
Age	Less than 30 years	43	19.55
	30-50 years	76	34.55
	More than 50 years	101	45.90
Total		220	%100
Sex	Male	122	55.45
	Female	98	44.55
Total		220	%100
Educational level	Less than high school	83	37.73
	High school	98	44.54
	University and above	39	17.73
Total		220	%100

The findings indicated that the majority of the study participants fell within the age group of 30-50 years, constituting approximately 34.55% of the sample. This was followed by the age group of over 50 years at 45.98%, indicating that the study focused largely on these two age groups. The least represented age group was under 30 years at 19.55%. The results also showed that there was a slight disparity in gender representation in the sample, with males constituting 55.45% and females 44.55%. This indicates that the sample generally represents a balanced gender distribution.

Educational level: The most represented educational level in the sample was the high school level at 44.54%. This was followed by the less than high school category at 37.73%. The least represented category was those with a university degree or higher at 17.73%.

Arithmetic middles and standard deviations

To obtain the required results, the arithmetic middles, the findings indicated that the majority of study sample is responses, at the level of the axis and its overall fields, where the results were as in the following table:

Table 4: Description of filed.

#	field	Rank	SMA	standard deviation	level
1	knowledge about peripheral artery disease	2	2.05	.944	middle
2	Attitudes towards prevention and treatment	1	2.32	.559	middle
3	Health practices associated with the disease	3	1.89	.851	middle
Total			2.09	.784	middle

The overall mean of 2.09 indicates that the overall level of awareness of the disease is in the medium range, i.e. it cannot be described as very high or low. This means that participants have basic knowledge of the disease, but not comprehensive or deep knowledge. In the knowledge domain, this domain received a mean of 2.05, indicating that participants have an average level of knowledge about PAD. The attitude domain received a mean of 2.32, which is slightly higher than the overall mean, indicating that participants generally have positive attitudes towards prevention and treatment. The health practices domain came in with a mean of 1.89, which is slightly lower than the overall mean, indicating that participants do not necessarily apply good health practices to prevent or treat the disease.

Results related to the areas of the study tool.

To obtain the required results, the Standard deviations, ranks, projected scores, and the arithmetic mean were taken out for the study sample's responses at the level of the questionnaire's subject areas. The results were as in the following table:

Table 5: The Standard deviations and arithmetic means of the sample members' answers to the fields of study

number	item	SMA	standard deviation	Rank	level	
1.	I know that peripheral artery disease is caused by narrowing or blockage of the arteries.	2.23	.669	2	middle	knowledge about peripheral artery disease
2.	Smoking, in my opinion, is a significant risk factor for PAD.	2.86	.678	1	High	
3.	I know that diabetes increases the risk of PAD.	2.13	1.019	3	middle	
4.	I know that high blood pressure can lead to narrowing of the arteries associated with PAD.	1.99	.972	4	middle	
5.	I have heard of the ankle-brachial index (ABI) screening.	1.34	.831	6	Low	
6.	I understand the importance of early diagnosis to avoid complications.	1.77	.919	5	middle	
Total		**2.05**		**middle**		
7.	I believe that following a healthy diet contributes to preventing the disease.	2.46	.875	2	High	Attitudes towards prevention and treatment
8.	I believe that exercising regularly reduces the risk of developing peripheral artery disease.	2.34	.809	3	middle	
9.	I believe in the importance of quitting smoking to prevent arterial disease.	2.54	1.014	1	High	
10.	I make sure to visit the doctor periodically to follow up on the health of the arteries.	2.24	1.017	4	middle	
11.	I agree with the importance of conducting periodic examinations to detect the disease.	2.02	.873	5	middle	
Total		**2.32**		**middle**		
12.	I measure my blood pressure regularly.	1.40	.548	4	Low	Health practices
13.	I make sure to regulate my blood sugar level.	2.25	.643	2	middle	

The table presents the results of a survey to assess participants' awareness of peripheral arterial disease (PAD). It shows high awareness regarding smoking as a risk factor (2.86). It shows relatively low awareness regarding the ankle-brachial index (ABI) and the role of hypertension in PAD.In the domain of attitudes towards prevention and treatment: positive attitudes towards a healthy diet, regular exercise and smoking cessation as preventive measures. However, lower scores were shown for "making sure to visit the doctor regularly" and "agreeing the importance of regular check-ups."

In the domain of health practices related to the disease: relatively high scores were shown for “taking prescribed medications regularly” and “regulating blood sugar”. Low scores were shown for “measuring blood pressure regularly” and “avoiding foods high in saturated fat and cholesterol.”

The gap between attitudes and practices: A common finding is that while individuals may have positive attitudes towards health behaviors, their actual practices may not always match these beliefs.

Overall, the results of this table indicate a moderate level of awareness among participants regarding PAD. While they are aware of some of the key risk factors and the importance of preventive measures, there are areas for improvement, particularly regarding screening, diagnostic awareness and adherence to healthy lifestyle practices.

Discussion

The results suggest that more efforts are needed to raise public awareness of PAD, particularly regarding health practices. Special emphasis should be placed on improving health practices associated with the disease, such as proper nutrition, exercise, and smoking cessation. Awareness programs can be customized based on individual differences in knowledge, attitudes, and health practices. Follow-up studies should also be conducted to evaluate the effectiveness of awareness programs in raising awareness and improving health practices. This study recommends expanding awareness programs to include broader segments of society, using a variety of media to spread awareness about the disease, including traditional and social media, training health workers on how to provide accurate and reliable information about PAD, and collaborating with governmental, private, and non-governmental organizations to enhance awareness efforts.

Limitations

This research study is subject to a few limitations that deserve consideration. The use of a questionnaire on outpatients may introduce a risk of selection bias, and this limitation may affect the generalizability of the results. Future studies are needed to enhance the comprehensiveness of the results and their generalizability across geographical areas including rural areas, camps, and less privileged areas in Jordan.

Conclusions

The overall mean of disease awareness was 2.09, indicating a medium level of knowledge, with the knowledge domain having a mean of 2.05, and the attitude domain having a mean of 2.32, reflecting positive attitudes towards prevention and treatment, while health practices had a mean of 1.89, indicating poor practical application of these practices. The results showed high awareness of the risks of smoking (2.86), but awareness of the ankle-brachial index (ABI) and the role of hypertension was lower. It was also found that there is a gap between health attitudes and practices, as positive attitudes are not necessarily reflected in actual behavior, indicating the need to enhance awareness of screening methods and adherence to healthy lifestyles. Patients’ awareness of the nature of PAD and its associated risks helps in early diagnosis and recognition of the first symptoms, such as pain while walking (intermittent claudication). This contributes to prevention of the disease and avoidance of complications. Additionally, it raises public awareness of risk factors such as smoking, obesity, diabetes, hypertension, and concurrent cardiovascular diseases, thereby improving overall community health. To enhance patient survival, doctors should address the underlying risk factors for mortality in this patient population, which are better understood thanks to this guidance. We recommend conducting more prospective research to assess its effects.

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