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The perception of palpitations and its risk factors among general population in the western region of Saudi Arabia: A cross-sectional study

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ABSTRACT

Background: Palpitations can be defined as the accelerated or irregular pulse sensations of the heartbeat and can be of physiological or pathological origins. This study aimed to evaluate the perception of palpitations and their risk factors among the general population residing in the western region of Saudi Arabia. *Material and Methods:* This study has a cross-sectional, descriptive, community-based design. A total of 990 willing participants were enrolled. The necessary information was meticulously collected utilizing an electronic online questionnaire via Google Forms, which consists distinctly of four sections: Participant consent, specific demographics, accurate perception of palpitations and the associated risk factors. *Results:* Most of the participants, 763 (77.1%) were females. Regarding the level of awareness, 924 (93.3%) participants exhibited sufficient knowledge about the definition of palpitations. The vast majority were college-educated, 768 (77.6%). Out of all participants 909 (91.8%) believed there is an association between palpitations and caffeinated drinks. The association between the demographics and the perception of palpitations were found to be significant with Gender (P = 0.000), stress (P = 0.000) marital status (P = 0.026) and educational level (P = 0.021). *Conclusion:* The level of awareness about palpitation in the western region of Saudi Arabia is adequate and impacted by various factors like gender, stress, marital status and level of education. We advocate more education on diseases that may manifest as palpitations, raising awareness of risk factors like caffeinated drinks and stress, recommending healthier alternatives and conducting more research for possible hidden associations.

Keywords: Palpitations, Perception, Risk Factors, Saudi Arabia.

1. INTRODUCTION

Palpitation is one of the most prevalent complaints encountered at outpatient

clinics (Goyal et al., 2021). Palpitations are sensations of an abnormally rapid or irregular heartbeat. Palpitations can be a normal physiological response, disease-mediated or induced by substances that increase adrenergic tone or diminish vagal activity (Brugada et al., 1993; Goyal et al., 2021). Normal palpitations are recognized by individuals who are aware of their heartbeats and realize the acceleration and the differences between them and the stable rate of the heart (Brugada et al., 1993; Alanazi et al., 2020). Palpitations are general symptoms or can be a possible diagnosis. Palpitation associations are extrasystolic, tachycardic, anxiety-related and intense (Goyal et al., 2021).

The symptoms of palpitation are considered sensory symptoms that may include a skipped heartbeat, hammering in the chest or neck, rapid fluttering in the chest, tachycardia and premature beats (Goyal et al., 2021; Brugada et al., 1993; Wexler et al., 2017).

Palpitations can be idiopathic or secondary to pathology (Thavendiranathan, 2009). The most prevalent causes of palpitations are cardiac and arrhythmias are the leading etiology (Wexler et al., 2017; Abbott, 2005; Alanzi et al., 2020) followed by valvular heart disease, cardiomyopathy and pacemaker use. Psychiatric conditions such as panic attacks and anxiety are the second most common or induced by medications and substances like sympathomimetics, vasodilators, anticholinergics, beta-blockers, nicotine, cocaine, amphetamines and caffeine. Hypoglycemia, thyrotoxicosis and pheochromocytoma are examples of endocrine disorders that can produce palpitation. Systemic physiological fluctuations like anemia, pregnancy, fever and exercise may induce palpitations (Alanzi et al., 2020).

A study conducted at Umm Al-Qura University in 2013 reported that 20% of 257 medical students experienced palpitation as a side effect of energy drink consumption (Bawazeer and Al Sobahi, 2013). Another study conducted in 2003 found that 34% of 184 individuals who complained of palpitations in an outpatient cardiac clinic had arrhythmia, 41% had extrasystoles and 26% were aware of sinus rhythm (Mayou et al., 2003; Weber and Kapoor, 1996). Patients with an underlying cardiac etiology may manifest as sudden death, thus establishing a diagnosis is critical (Alanzi et al., 2020; Wexler et al., 2017).

A central region study encouraged additional studies to identify the current knowledge gaps regarding palpitations. Hence, we aimed to assess the perception of palpitations and their risk factors among the general population in the western region of Saudi Arabia (Alanzi et al., 2020).

2. MATERIALS AND METHODS

A cross-sectional community-based descriptive study in the western region of Saudi Arabia was conducted from January 2022 to October 2022 and the estimated population was 8,557,766, as reported by the general authority of statistics in Saudi Arabia. The calculated sample size was obtained by the epi software VER 2.1 and estimated at 385. A pretested electronic survey was distributed among the general population of residents in the western region of Saudi Arabia who are 18 years of age and above via various social media platforms like WhatsApp and Telegram.

The survey was obtained from a relevant study conducted in the central region of Saudi Arabia for the assessment of palpitation awareness (Alanzi et al., 2020), which is composed of four parts, consent for participation in the study, specific socio-demographic data such as gender, age and nationality, the second section was for the perception of palpitations by specific items to be answered and interpreted, the last section was for palpitations possible risk factors and associations, all of which are guided and supported by the literature review. The total number of participants was 990. The provided data was analyzed using the statistical package for social sciences (SPSS) version 25. Descriptive statistics analysis was applied for the summarization and reporting of the different variables, continuous or numerical variables were represented as mean ± SD or as range and median according to the distribution type of each variable. For categorical variables, frequency and percentage were applied and comparison between the study groups was performed by the Mann-Whitney test or Student's t-test. Regarding the association between categorical variables, the chi-square test was utilized. The statistical significance was demonstrated by the P-value < 0.05 with a confidence interval of 95%. The study obtained ethical approval from UMM al-Qura University Registration No. in National committee of Bio Ethics: HAPO-02-K-012-2022-01-903 and all provided information was kept confidential and utilized for the research solely.

3. RESULTS

There were 990 participants in the study, of which 763 (77.1%) were females, while males numbered 227 (22.9%). The mean age was 32.77 years (SD ± 12.57). Most of the participants had Saudi nationality 918 (92.7%). Regarding marital status, 473 (47.8%) was married, followed by single, 471 (47.6%). Most participants resided in Makkah 698 (70.5%), followed by Jeddah 292 (29.5%). More than three-fourths of the participants had a bachelor's degree concerning their educational level, 768 (77.6%). The highest proportion, 479 (48.4%) had a monthly income of fewer than 3000 Saudi Riyals (Table 1).

Table 1 Socio-demographic data of participants

		N (%) 990 (100%)
Age (years)	18 - 30	525 (53.0)
	31 - 40	196 (19.8)
	41 - 50	161 (16.3)
	51 - 60	85 (8.6)
	More than 60	23 (2.3)
BMI	Underweight	92 (9.4)
	Normal BMI	410 (41.5)
	Overweight	242 (24.5)
	Obese	243 (24.6)
Gender	Male	227 (22.9)
	Female	763 (77.1)
Nationality	Saudi	918 (92.7)
	Non-Saudi	72 (7.3)
Residency	Makkah	698 (70.5)
	Jeddah	292 (29.5)
Marital status	Single	471 (47.6)
	Married	473 (47.8)
	Divorced	34 (3.4)
	Widowed	12 (1.2)
Educational level	Primary	4 (.4)
	Intermediate	14 (1.4)
	High school	153 (15.5)
	Bachelor	768 (77.6/)
	Uneducated	2 (.2)
	Other	49 (4.9)
Occupation	Student	392 (39.6)
	Employed	333 (33.6)
	Unemployed	265 (26.8)
Income level (SR)	Less than 5000	587 (59.3)
	5000 - 10,000	131 (13.3)
	More than 10,000	272 (27.4)

Regarding the level of perception, 924 (93.3%) of participants reported the correct definition of palpitations as a feeling of abnormal and rapid heartbeat, 31 (3.1%) had inadequate perception regarding the correct definition, while 35 (3.6%) did not know what palpitation was. However, 909 (91.8%) think there is a relationship between palpitations and caffeine consumption and 779 (78.7%) participants knew when to seek help if they had palpitations (Table 2).

Table 2 Perception of the general population toward palpitations

		N (%) 990 (100%)
What is the definition of palpitations?	A feeling of abnormal and increasing heart rate	924 (93.3)
	Slowing in heart rate	28 (2.8)
	Stop heart rate for a while	3 (.3)

	I don't know	35 (3.5)
Do you think there is a relation between palpitations and caffeine consumption?	Yes	909 (91.8)
	No	33 (3.3)
	I don't know	48 (4.8)
Do you think the person complaining of palpitations must visit the doctor?	Yes	779 (78.7)
	No	95 (9.6)
	I don't know	116 (11.7)
Which of the following is the cause of palpitations?	Cardiovascular diseases	492 (49.6)
	Pulmonary diseases	114 (11.5)
	Thyroid diseases	260 (26.2)
	Psychiatric illness	442 (44.6)
	Sleep deprivation	565 (57.0)
	Energy drinks	653 (65.9)
	Exercises	407 (41.1)
	Food-related	262 (26.4)
	Unknown causes	175 (17.7)
	I don't know	91 (9.2)
Which of the following symptoms are associated with palpitations?	Loss of consciousness	209 (21.1)
	Drowsiness	220 (22.2)
	Chest pain	309 (31.2)
	Shortness of breath	336 (33.9)
	All the above	613 (61.9)
	I don't know	68 (6.9)
What is your source of information?	Health educator/physician	305 (30.8)
	Internets/social media	497 (50.2)
	Television	115 (11.6)
	Radio	27 (2.7)
	Newspaper/magazine	79 (8.0)
	Friend/someone	192 (19.4)

670 (67.7%) participants experienced palpitations and 547 (81.6%) were females. 118 (11.9%) participants were smokers and 82 (69.5%) experienced palpitations. 182 (18.4%) participants always experienced stressful life events, 503 (50.8%) sometimes, 180 (18.2%) rarely, while 125 (12.6%) never experienced stressful life events.

Table 3 The association between perception of palpitations and the demographics

Variable		Yes N (%)	No N (%)	I don't know N (%)	p-value
Age (years)	18 – 30	358 (68.2)	111 (21.1)	56 (10.7)	.123
	31 – 40	121 (61.7)	59 (30.1)	16 (8.2)	
	41 – 50	111 (68.9)	38 (23.6)	12 (7.5)	
	51 - 60	66 (77.6)	14 (16.5)	5 (5.9)	
	More than 60	14 (60.9)	7 (30.4)	2 (8.7)	
BMI	Underweight	66 (71.7)	16 (17.4)	10 (10.9)	.296
	Normal BMI	264 (64.4)	108 (26.3)	38 (9.3)	
	Overweight	176 (72.7)	46 (19.0)	20 (8.3)	
	Obese	163 (67.1)	57 (23.5)	23 (9.5)	
Gender	Male	123 (54.2)	67 (29.5)	37 (16.3)	.000*
	Female	547 (71.7)	162 (21.2)	54 (7.1)	

Nationality	Saudi	625 (68.1)	207 (22.5)	86 (9.4)	.275
	Non-Saudi	45 (62.5)	22 (30.6)	5 (6.9)	
Marital status	Single	318 (67.0)	101 (24.4)	52 (11.1)	.026*
	Married	317 (31.1)	120 (25.4)	36 (7.6)	
	Divorced	26 (76.5)	8 (23.5)	0 (0)	
	Widow	9 (75.0)	0 (0)	3 (25)	
Educational level	Uneducated	1 (50)	0 (0)	1 (50)	.021*
	Primary	2 (50.0)	2 (50.0)	0	
	Intermediate	6 (42.9)	5 (35.7)	3 (21.4)	
	High school	96 (62.7.7)	37 (24.2)	20 (13.1)	
	Bachelor	539 (70.2)	168 (21.9)	61 (7.9)	
	Other	26 (53.1)	17 (34.7)	6 (12.2)	
Occupation	Student	274 (69.9)	82 (20.9)	36 (9.2)	.595
	Employed	226 (67.9)	78 (23.4)	29 (8.7)	
	Unemployed	170 (64.2)	69 (26.0)	26 (9.8)	
Income level (SR)	Less than 5000	383 (65.2)	142 (24.2)	62 (10.6)	.236
	5000 - 10,000	92 (70.2)	31 (23.7)	8 (6.1)	
	More than 10,000	195 (71.7)	56 (20.6)	21 (7.7)	
Do you smoke?	Yes	82 (69.5)	25 (21.2)	11 (9.3)	.941
	No	562 (67.3)	197 (23.6)	76 (9.1)	
	Ex-smoker	26 (70.3)	7 (18.9)	4 (10.8)	
How often do you complain of stress?	Always	156 (85.7)	13 (7.1)	13 (7.1)	.000*
	Sometimes	352 (70.0)	103 (20.5)	48 (9.5)	
	Rare	117 (65.0)	45 (25.0)	18 (10.0)	
	Never	45 (36.0)	68 (54.4)	12 (9.6)	

4. DISCUSSION

Palpitations are common and reflect different etiologies with a comprehensive list of seriousness (Alanzi et al., 2020). The American Heart Association (AHA) documented that out of 502627 adults, 2.35% had baseline rhythm instability along with the highlighted risk factors like age, male gender, white ethnicity and chronic cardiovascular diseases and reported that smocking had an association with the development of arrhythmias (Khurshid et al., 2018).

Hassen et al., (2022) reported that knowledge of cardiovascular disease risks and prevention was low among vulnerable communities and found significant variations in educational levels. Therefore, increasing education and awareness is critical. Machaalani et al., (2022) reported that the knowledge and practices regarding cardiovascular diseases were undesirable and recommended well-structured national awareness events to be carried out.

Alanzi et al., (2020) found that most participants had adequate knowledge concerning palpitations. Their level of perception was associated with education and age and demonstrated by the ability of the participants to comprehend basic information. The majority defined palpitation correctly and estimated if there was a relation between caffeine consummation and when to seek medical care due to palpitations, 261 (78.9%), 211 (63.7%) and 150 (45.3%), respectively. Compared to our study, participants defined palpitation appropriately, believed there was an association with caffeine consummation and believed that palpitations should be evaluated by a doctor, 924 (93.3%), 909 (91.8%) and 779 (78.7%), respectively.

Subaiea et al., (2019) found that palpitations had a strong relationship with caffeine as it was one of the top three reported adverse effects of caffeine consumption. That is consistent with our findings 91.8% of participants believed there was an association. Another study of the same year found that most students consume caffeinated beverages to feel more awake and alert, enhance performance and endure stressful events (Mahoney et al., 2019). Thus, promoting healthy and safe alternatives like stress accommodation courses or natural enhancers in schools and universities is advocated.

Unintentionally most participants were females in our study, which may have impacted the results. Furthermore, Schreuder et al., (2019) found an association between cardiac autonomic regulation and the hormonal changes experienced during menstrual cycles and encouraged further research in this context to explore the present knowledge gaps. Sheng et al., (2021) systematic review also promoted the need for focused research regarding palpitations as a reflective symptom of menopausal status.

Physiological factors are one of the most common causes of palpitations (Alanzi et al., 2020). Lawless et al., (2015) found a strong relationship between smoking and stress, formulating a cycle of synergism combining stress, smoking and palpitations. Smoking is proven to cause long-term and short-term harm to the entire body, particularly the lungs and heart. New modalities, such as electronic cigarettes, have been found to cause immediate discomfort, primarily in the form of palpitations and cough or sore throat, for which we recommend diverse education on different forms of smocking and its dangerous influence on the community.

Clementy et al., (2018) found that out of 688 patients presented in the cardiac emergency department with palpitations, 81% had cardiac arrhythmia. 96% were diagnosed based on the initial intervention, which solidifies the need for a careful approach to palpitations as a symptom.

5. CONCLUSIONS

The present study aimed to assess palpitation awareness level among the western region and found that it is adequate, gender, stress, marital status and level of education had significant association. Palpitation risk factors are common and overlap such as, stress, smoking therefore further awareness campaigns is recommended.

List of Abbreviation

Statistical package for social sciences (SPSS)
American Heart Association (AHA)

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Ethical approval

The study was approved by the Medical Ethics Committee of Umm Al-Qura University (ethical approval code: Approval No (HAPO-02-K-012-2022-01-903)).

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES AND NOTES

1. Abbott AV. Diagnostic approach to palpitations. Am Fam Physician 2005; 15:71(4):743-50.
2. Alanzi F, Alotaibi K, Almutlaq F, Aldahash A, Alsenani A. Awareness of adult population toward palpitation and its risk factors in Riyadh region, Saudi Arabia. Int J Med Dev Cntries 2020; 4(2):383–388. doi: 10.24911/IJMDC.51-1575930917
3. Bawazeer NA, Alsobahi NA. Prevalence and side effects of energy drink consumption among medical students at Umm Al-Qura University, Saudi Arabia. Int J Med Stud 2013; 1(3): 104–108. doi: 10.5195/ijms.2013.215
4. Brugada P, Gürsoy S, Brugada J, Andries E. Investigation of palpitations. Lancet 1993; 341(8855):1254-8. doi: 10.1016/0140-6736(93)91155-f
5. Clementy N, Fourquet A, Andre C, Bisson A, Pierre B, Fauchier L, Babuty D, Angoulvant D. Benefits of an early management of palpitations. Med (Baltimore) 2018; 97(28):e 11466. doi: 10.1097/MD.0000000000011466
6. Goyal A, Robinson KJ, Katta S, Sanchack KE. Palpitations. In: Stat Pearls (Internet) 2021. https://www.ncbi.nlm.nih.gov/books/NBK436016/
7. Hassen HY, Bowyer M, Gibson L, Steven A, Hilde B. Level of cardiovascular disease knowledge, risk perception and intention towards healthy lifestyle and socioeconomic disparities among adults in vulnerable communities of Belgium and England. BMC Public Health 2022; 22(1):197. doi: 10.1186/s12889-022-12608-z
8. Khurshid S, Choi SH, Weng LC, Wang EY, Trinquart L, Benjamin EJ, Ellinor PT, Lubitz SA. Frequency of cardiac

rhythm abnormalities in a half million adults. Circ Arrhythm Electrophysiol 2018; 11(7):e006273. doi: 10.1161/CIRCEP.118.006273

9. Lawless MH, Harrison KA, Grandits GA, Eberly LE, Allen SS. Perceived stress and smoking-related behaviors and symptomatology in male and female smokers. Addict Behav 2015; 51:80-83. doi: 10.1016/j.addbeh.2015.07.011
10. Machaalani M, Fakhry B, Zwaideh M, Mendelek K, Mahmoud N, Hammoud T, Chahine MN. Knowledge, attitude and practice toward cardiovascular diseases in the Lebanese population. Glob Heart 2022; 17(1):47. doi: 10.5334/gh.1138
11. Mahoney CR, Giles GE, Marriott BP, Judelson DA, Glickman EL, Geiselman PJ, Lieberman HR. Intake of caffeine from all sources and reasons for use by college students. Clin Nutr 2019; 38(2):668-675. doi: 10.1016/j.clnu.2018.04.004
12. Mayou R, Sprigings D, Birkhead J, Price J. Characteristics of patients presenting to a cardiac clinic with palpitation. QJM 2003; 96(1):115–123. doi: 10.1093/qjmed/hcg017
13. Schreuder MM, Sunamura M, Lennep JER. Supraventricular tachycardia and the menstrual cycle. Case Rep Women's Health 2019; 24:e00153. doi: 10.1016/j.crwh.2019.e00153
14. Sheng Y, Carpenter JS, Elomba CD, Alwine JS, Yue M, Pike CA, Chen CX, Tisdale JE. Review of menopausal palpitations measures. Womens Midlife Health 2021; **7**:5. doi: 10.1186/s40695-021-00063-6
15. Subaiea GM, Altebainawi AF, Alshammari TM. Energy drinks and population health: Consumption pattern and adverse effects among Saudi population. BMC Public Health 2019; 19:1539. doi: 10.1186/s12889-019-7731-z
16. Thavendiranathan P, Bagai A, Khoo C, Dorian P, Choudhry NK. Does this patient with palpitations have a cardiac arrhythmia? J Am Med Assoc 2009; 302(19):2135-43. doi: 10.1001/jama.2009.1673
17. Weber BE, Kapoor WN. Evaluation and outcomes of patients with palpitations. Am J Med 1996; 100(2):138-148. doi: 10.1016/S0002-9343(97)89451-X
18. Wexler RK, Pleister A, Raman SV. Palpitations: Evaluation in the primary care setting. Am Fam Physician 2017; 96(12): 784-789.