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Physical activity and quality of life in adults with heart disease from Guasave, Sinaloa, Mexico

Actividad física y calidad de vida en adultos con enfermedad cardiaca de Guasave, Sinaloa, México

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ABSTRACT

Ischaemic heart disease is the leading cause of death worldwide, and arterial hypertension affects between 20% and 40% of the adult Mexican population, representing an important factor in the reduction of quality of life. The aim was to analyse the association between the level of physical activity and health-related quality of life in people with coronary heart disease. A descriptive correlational study with an exploratory cross-sectional design was conducted in individuals with heart disease from Sinaloa, Mexico. The short version of the International Physical Activity Questionnaire was used to assess the level of physical exertion, and the WHOQOL-BREF was applied to measure quality of life. The level of physical exertion was classified into three subgroups: high, moderate, and low. Participants had a mean age of 57.1 years (SD = 15); 61.8% were women and the remainder were men. When comparing by sex, women showed lower levels of physical activity than men. Among participants with low levels of physical activity, an association was observed between psychological health and environmental health ($p < .05$). Only 16.8% reported meeting the minimum recommended levels of physical activity for health. Individuals with heart disease

from both urban and rural areas of northern Sinaloa showed a low and moderate level of physical exertion. Engagement in physical activity is a determining factor in quality of life, with a greater impact on the physical, social, and psychological dimensions in this subgroup.

KEY WORDS: physical activity, quality of life, heart disease, psychological health.

RESUMEN

La cardiopatía isquémica es la principal causa de muerte en el mundo y la hipertensión arterial afecta entre el 20 y 40% de la población mexicana adulta, siendo un factor importante para reducir la calidad de vida. Se propuso analizar la asociación entre el nivel de actividad física y la calidad de vida relacionada con la salud en personas con enfermedad coronaria. Estudio descriptivo correlacional con alcance transversal exploratorio en sujetos con cardiopatía de Sinaloa, México. Se aplicaron la versión corta del Cuestionario Internacional de Actividad Física para el nivel de esfuerzo físico, y el WHOQOL-BREF para medir la calidad de vida. Se clasificó el nivel de esfuerzo por actividad física en tres subgrupos: alto, medio y bajo. Participantes con edad promedio de 57.1 años (*DE*=15), 61.8% mujeres, el resto hombres. Al comparar por sexo, las mujeres presentaron menor nivel de actividad física que los hombres. En participantes con nivel de actividad física bajo se observó entre la salud psicológica y salud ambiental ($p < .05$). Solo el 16.8% reportó cumplir con las recomendaciones mínimas de actividad física para la salud. Ciudadanos con cardiopatía de la zona urbana y rural de la zona norte de Sinaloa, presentan un nivel de esfuerzo por actividad física principalmente bajo a medio. La práctica de actividad física es determinante en la calidad de vida con mayor impacto en las dimensiones físicas, sociales y psicológicas para este subgrupo.

PALABRAS CLAVE: actividad física, calidad de vida, enfermedad cardiaca, salud psicológica.

INTRODUCTION

Recent advances in cardiology and exercise prescription have identified a tendency among cardiologists to direct patients toward guided physical activity and exercise (1). Properly prescribed physical activity (PA) improves health-related quality of life (HRQoL) and increases people's functional capacity, while aerobic exercise improves physical condition and reflects significant changes in the cardiovascular system (2). PA has been shown to increase functionality, corresponding to heart rate, respiratory rate, and blood pressure, which allows people to manage their autonomy, establish self-confidence and self-assurance, which translates into well-being or better health (3).

In relation to PA and HRQoL, it impacts individuals with heart disease by restoring their autonomy, sense of security in performing daily activities, and

feeling equal to others in society. The patient's quality of life reflects physical, social, and mental well-being, allowing them to regain their work and social life (4). On the other hand, the benefits of physical exercise and PA in people with heart disease are considered to have a positive influence on psychological indicators, as they participate in different social groups, which promote coexistence and improve depressive behaviors or states in people; therefore, studies have considered the association of these activities with cardiovascular disease risk models (5).

Patients with cardiovascular disease tend to resist physical activity because they fear losing their lives. Underdeveloped countries still lack awareness in society for primary and secondary care for cardiovascular diseases, while first world countries show an increase in adherence among individuals with heart disease, who demonstrate an interest in integrating physical exercise into their lives (6). Therefore, the purpose of this study is to evaluate the level of physical activity and quality of life in individuals with coronary heart disease in Guasave, Sinaloa.

MATERIALS AND METHODS

This was a descriptive, correlational, cross-sectional, exploratory study (7). Using a non-probability convenience sample with snowball sampling, the survey was administered by the assistants of cardiology specialists at a public institution and several private institutions in the northwestern part of the state of Sinaloa, Mexico.

Women and men who were citizens of the state of Sinaloa, Mexico, were included. They were over 50 years of age, had been diagnosed with coronary heart disease by a treating cardiologist (verified with clinical records), agreed to participate voluntarily after reading the online informed consent form, and appeared to be in optimal physical and mental condition to answer questionnaires. All subjects without verbal evidence of a diagnosis of disease or coronary heart disease were excluded from the study, as were people with mental illness, mental impairment, or altered states of consciousness. Data from cases with inconsistent responses, mainly in the MET count using the IPAQ instrument (e.g., estimated energy expenditure greater than 4000 METs), were removed from the study.

Research instruments, techniques, and procedures

Physical activity

The International Physical Activity Questionnaire (IPAQ) short version, which was administered directly, by telephone, or self-administered, is a 7-question questionnaire focused on the activities performed directly by the individual in the last 7 days. The questions are aimed at classifying activities in leisure time or while seated, physical activities of daily living such as walking, or those related to work, transportation, or domestic activities, which can be

classified as high, medium, or low intensity. The unit of measurement used in this instrument is MET (8).

Quality of life

The WHOQOL-BREF health-related quality of life questionnaire, which assesses perceptions of physical health, psychological health, social relationships, and environment over the past two weeks. Simple questions are answered about perceptions of health-related quality of life (9). For evaluation, indices from 0 to 100 were estimated per subscale.

Procedures

The project was approved by the Bioethics Committee of the Autonomous University of the West, based on official letter CM-UAdeO 03.10/2020. To carry out the project and collect data, the project considered the guidelines established for scientific research with human subjects set forth in the Declaration of Helsinki (10) and those proposed by the General Health Law on Research (11). Subsequently, students from the Bachelor's Degree in Physical Therapy and Rehabilitation at the Autonomous University of the West who wished to assist as surveyors were trained in conjunction with medical assistants specializing in cardiology. The students who accepted the offer and collaborated with this project were trained to apply the instruments digitally on smartphones or tablets (hetero-administered online survey to promote participant understanding). Once the training was completed, the search for candidates to participate began. The selection criteria were reviewed, and acceptance was obtained through informed consent. The hetero-administered collection instruments were then filled out through interviews.

Data analysis

The results were analyzed using SPSS statistical software version 21.0. Measures of central tendency and dispersion were included to describe the characteristics of the participants (mean, median, SD), sociodemographic variables, physical activity, and dimensions of quality of life in relation to physical, psychological, social, and environmental health. The reliability of the WHOQOL-BREF questionnaire subscales was reviewed using Cronbach's alpha; the subscales had acceptable values (alpha = .74 to .81), with the exception of social health (alpha = .52); this situation could not be resolved by eliminating items. The findings of this subscale should be considered with caution.

The Kolmogorov Smirnov test with Lilliefors correction was applied to evaluate the data distribution. The critical value for alpha was .05. To measure the influence between the study variables and the value that the independent variable exerts on the dependent variable, association analysis was used according to the data distribution through Mann Whitney U tests and Spearman correlation, as appropriate.

RESULTS

Sociodemographic data

Data were collected from 99 candidates. After reviewing the selection criteria, a descriptive analysis was performed on a total of 89 participants who gave their consent to participate in this project, with an average age of 57.1 years (SD=15), 61.8% women, and the rest men. Eighty-two percent reside in Guasave, Sinaloa. Average anthropometric measurements were 83.6 kg (SD = 8.4) for body weight and 165 cm (SD = 8.4) for height. Fifty-six percent reported drinking or having drunk alcohol frequently, and 32.6% admitted to smoking. Seventy-one point nine percent reported not engaging in regular physical activity. Table 1 presents the description of the age and body characteristics of the complete sample. When comparing by sex, it was found that participants differed in age and body composition ($p < .05$).

Table 1. Descriptive characteristics of the sample by gender.

	Women			Men		
	Avg	**Median**	**SD**	**Avg**	**Median**	**SD**
Age (years)	54.60	53.00	14.602	61.21	62.00	15.08
Weight (kg)	78.53	78.00	17.577	92.00	90.00	18.13
Height (cm)	162.00	162.00	7.040	172.41	170.00	6.30
BMI (kg/m^2)	29.80	29.24	5.27	30.98	28.56	6.05

Nota: BMI = Body mass index. *n* = 89.

In relation to physical activity assessed using the short version of the IPAQ, participants' physical activity levels were estimated in METs. Table 2 shows the physical activity levels of the entire sample.

Table 2. Perception of physical activity in the entire sample.

	Avg	**Median**	**SD**
VPA, Mets	865.75	160.00	1405.16
MPA, Mets	487.82	120.00	825.84
LPA, Mets	665.44	297.00	1056.24
IPAQ, Mets	2003.62	764.00	2678.38
ST, Min	293.41	310.00	140.25

Note: VPA = Vigorous physical activity; METs = Metabolic equivalent; MPA = Moderate physical activity; LPA = Light physical activity; IPAQ = Sum of METs; ST = Sedentary time; n = 89.

In addition, the level of physical activity by gender is presented. No differences were found between groups in this regard (Table 3).

Table 3. Perception of physical activity by gender.

	Women (n = 55)			Men (n = 34)		
	Avg	**Median**	**SD**	**Avg**	**Median**	**SD**
VPA (Mets)	916.3	60.0	1558.5	783.0	160.0	1128.0
MPA (Mets)	538.5	100.0	849.6	404.9	120.0	791.3
LPA (Mets)	621.3	297.0	921.8	739.0	264.0	1261.1
IPAQ (Mets)	2049.7	579.0	2802.9	1926.9	891.0	2497.4
ST, min	284.2	300.0	158.9	308.8	330.0	102.3

Note: VPA = Vigorous physical activity; METs = Metabolic equivalent; MPA = Moderate physical activity; LPA = Light physical activity; IPAQ = Sum of METs; ST = Sedentary time.

The physical activity level of the entire sample was classified into three subgroups: high, medium, and low physical activity, based on METs consumption per week. The description of the entire sample and by sex is shown in Figure 1.

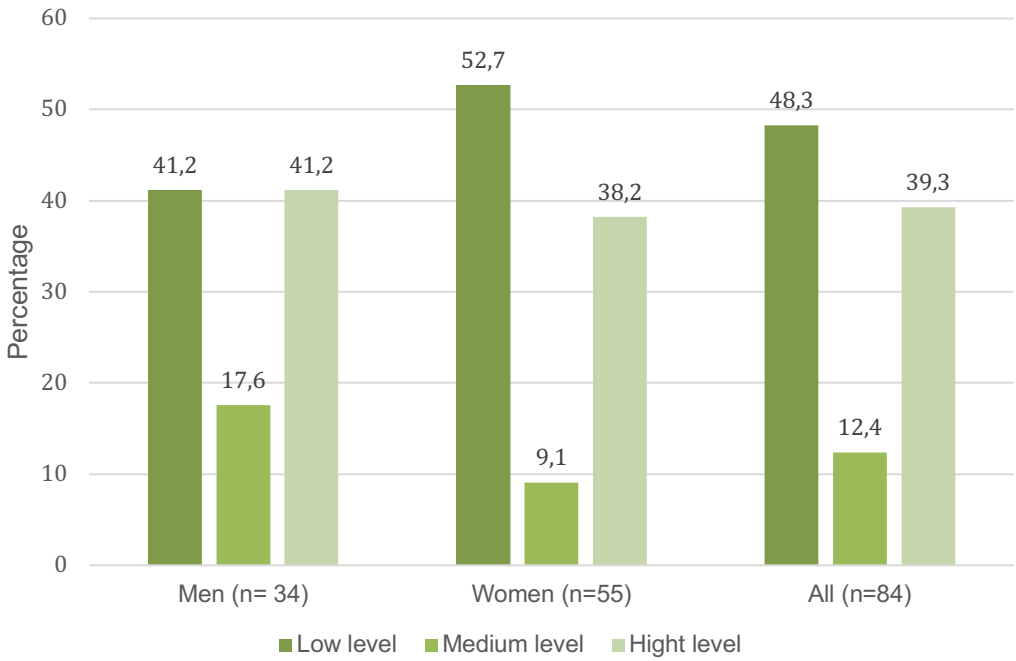

Figure 1. Classification of physical activity level of the sample by gender

In accordance with the objective of measuring HRQoL, the questionnaire was processed and information was obtained from the entire sample and by gender. The statistical description is presented in Table 4.

Table 4. Dimensions of quality of life in the complete sample and by gender.

	Mean	Median	SD	Asymmetry	Kurtosis
Women (*n*= 55)					
Physical health	67.58	65.71	13.95	-0.37	0.97
Psychological health	70.55	73.33	12.53	-0.14	0.84
Social health	67.52	66.67	14.46	-0.14	0.12
Environmental health	64.68	62.50	10.12	1.04	2.01
Men (*n*=34)					
Physical health	67.48	65.71	13.87	-0.09	0.10
Psychological health	73.24	71.67	11.50	0.15	-1.14
Social health	68.04	66.67	10.61	0.26	-0.03
Environmental health	67.21	67.50	8.85	0.05	-0.32
All (*n*= 89)					
Physical health	67.54	65.71	13.84	-0.26	0.55
Psychological health	71.57	73.33	12.16	-0.08	0.27
Social health	67.72	66.67	13.06	-0.08	0.29
Environmental health	65.65	65.00	9.68	0.68	1.03

Note: SD = Standard Deviation
Source: WHOQOL-BREF.

Prior to inferential analysis, the distribution of the data was reviewed using the Kolmogorov-Smirnov test with Lilliefors correction. The distribution of the data suggests that nonparametric statistics should be used. To review the association between variables, a Spearman correlation matrix was run (Table 5).

Table 5. Association between study variables

Variable	1	2	3	4	5
1. IPAQ METs	1.000				
2. Sedentary Time	.050	1.000			
3. Physical health	.389**	.002	1.000		
4. Psychological health	.127	.035	.632**	1.000	
5. Social health	.243*	.045	.439**	.554**	1.000
6. Environmental health	.026	.179	.400**	.592**	.588**

Source: International Physical Activity Questionnaire; WHOQOL-BREF.
*$p < .05$; **$p < .01$. $n = 89$.

DISCUSSION

This study provided insight into the characteristics of a sample of residents in the northern part of the state of Sinaloa, Mexico. The sociodemographic and pathological characteristics of a sample of people with coronary heart disease were analyzed, along with their habits, tendencies toward PA, and exercise. The results showed the level of physical activity and guidelines aimed at reducing sedentary habits, as well as increasing PA and its relationship with HRQoL. The main findings of this study highlight that high blood pressure is a predictive indicator for an increased level of cardiovascular risk, like the rest of the Mexican

population. Studies conducted by the National Institute of Statistics and Geography (12) attribute this to the high number of Mexicans who report this current health condition. In reference to the dimensions of SRQ, a positive association was found between the dimensions of physical and psychological health and a high level of PA.

The personal and sociodemographic characteristics of the sample were like those of the rest of the Mexican population in terms of cardiovascular risk factors or incidence of coronary heart disease, figures that have increased in the Mexican population following the COVID-19 pandemic (13).

The sample analyzed in this phase of the project showed that 32.6% had smoking habits. Among other significant data, 71.9% stated that they did not engage in physical activity, both of which have a negative impact on SRQ. In a systematic literature search, publications such as those by Aranda (14) conclude that the level of PA is a determinant of SRQ and has a greater impact on the physical, social, and psychological dimensions for this subgroup.

When analyzing the factors that influence the risk of developing coronary heart disease and negatively impact SRQ, the findings in the anthropometric data related to body mass index were of interest. resulting in an average of 30.98 for women and 29.80 for men. Current studies refer to the association of this variable with a decrease in SRQ and a decrease in the favorable prognosis for subjects with disease (15).

The assessment of PA levels identified that the sample analyzed, on average, has a medium level of activity, and that men engage in less physical activity than women. Current studies emphasize the importance of primary and secondary prevention for cardiovascular diseases. Other studies (16) discuss the importance of continuing to promote the implementation of programs that increase the level of physical activity in older adults to prevent the development of coronary heart disease, highlighting the importance of high PA associated with a decrease in biomarkers such as systolic blood pressure and lipid profile.

In relation to the above, for more than twenty years, the influence of PA and the intensity of physical exercise on the cardiovascular system has been studied, providing science with guidelines that support the prevention of morbidity from cardiovascular diseases. However, the struggle to reduce the risk of death and increase HRQoL remain challenges for future research (17). On the other hand, the level of PA and the findings in WHOQOL-BREF HRQoL significantly associated the level of PA with physical and social health. Similar data found by other authors (18) provide evidence that recreational activities have a positive impact on HRQoL and that a sedentary lifestyle is negatively related to psychological health. The authors also highlight the importance of using free time for recreational activities through physical exercise.

Considering the results, the participants in this project are not making sufficient use of their free time for physical exercise. The data shows that only 16.8% meet the minimum recommendations for exercise, according to the

guidelines for exercise prescription and the recommendations of the World Health Organization, a minimum of 150 minutes per week of moderate aerobic activity or 75 minutes of vigorous aerobic activity is estimated (19). Clinical trials related to AF and exercise are needed, with new and innovative treatment guidelines, in line with the guidelines for physical exercise prescription, to increase adherence to rehabilitation in this population subgroup (20). It will be a priority to investigate the local trends and characteristics of this population group in order to identify strategies that will lead to these individuals adhering to exercise, with a view to improving their HRQoL and the progressive effects of coronary heart disease.

The assessment of PA levels and their relationship with HRQoL serves as a guideline for establishing guidelines for the development of activities, recommendations on physical exercise and cardiac rehabilitation. Although citizens in urban and rural areas in northern Sinaloa perceive their PA levels to be average, programs promoting physical exercise need to be implemented. It will be essential for future research to design strategies for recruiting and retaining participants. It is important to involve collaboration between the main public and private health clinics in the area to join forces in the dissemination, awareness, and implementation of these programs. It is important to work on the barriers associated with low participation by subjects with coronary heart disease. It is essential to analyze, in accordance with the literature, the social needs for adherence to physical exercise and cardiac rehabilitation programs.

It is hoped that raising awareness will encourage people to reflect and channel their free time into developing healthy habits and self-care, as these are key factors in overall health. Given the vulnerability of this population, educational and psychological support strategies should be strengthened during heart disease. For people with comorbidities and coronary heart disease, future research should develop cardiovascular rehabilitation plans and programs that analyze stratifications for the selection of subjects with coronary heart disease and comply with safety and efficacy regulations. The WHOQOL-BREF showed reliability and feasibility in its application to residents of northern Sinaloa. The IPAQ instrument is suggested to be applied to different age groups. HRQoL and AF are highly associated, and their correlation is identified to a greater extent in the physical and social health dimensions.

LIMITATIONS AND FUTURE DIRECTIONS

Due to the context of the study, it was necessary to accept various limitations inherent to the design, such as self-reporting of physical activity, memory bias associated with age and characteristics of the participants, and certainly, non-probabilistic sampling, which affects the representativeness of the results. Future research should seek strategies for objective evaluation using physical tests. On the other hand, the application of instruments through mobile devices is innovative, but there is still a lack of awareness among older adults in the state of Sinaloa.

For future research, it is proposed to investigate the eating habits of the population of Sinaloa, primarily regarding sodium consumption. Furthermore, exploratory studies are needed in Mexico to identify the needs in relation to barriers and adherence to physical exercise in patients with coronary heart disease. Future research should continue to raise awareness of the needs of adults with coronary heart disease so that they can be included in intervention programs through physical exercise and counseling that provide them with information on improving their healthy habits and quality of leisure time.

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