

Physical activity and quality of life in persons with visual impairment: an observational study

Atividade física e qualidade de vida em pessoas com deficiência visual: um estudo observacional

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ABSTRACT

AIMS: Little evidence demonstrates the influence of physical activity habits on the quality of life of people with visual impairment (VI). To gain a broader understanding, this study attempted to verify the relation between the habits of physical activity and quality of life in people with VI. **METHODS:** The sample consisted of 53 visually impaired volunteers. The Clinical and Sociodemographic Assessment Sheet, the International Physical Activity Questionnaire short version and the Quality of Life Assessment Instrument (WHOQOL-Bref) were used.

RESULTS: The mean age was 42.39±2.10 years, with a predominance of males and the mean Body Mass Index was 27.55±0.76. Predominant physical activity levels were between moderate to high. Males presented significantly higher levels of vigorous physical activity ($p=0.033$) and higher scores in WHOQOL-Bref, when compared to the female sex.

CONCLUSION: The higher the physical activity levels of this population with VI, the better the quality of life. The participants had a predominance of moderate to high physical activity, as well as, the male presented higher levels of physical activity, when compared with the female in vigorous activities.

KEYWORD: Exercise; blindness; disabled persons; quality of life.

RESUMO

OBJETIVOS: Pouca evidência demonstra a influência dos hábitos de atividade física na qualidade de vida de pessoas com deficiência visual. A fim de alcançar uma compreensão maior sobre o tema, este estudo procurou verificar a relação entre os hábitos de atividade física e a qualidade de vida de pessoas com deficiência visual.

MÉTODOS: A amostra foi composta por 53 voluntários com deficiência visual. Utilizou-se a ficha de avaliação sociodemográfica e clínica, a versão curta do Questionário internacional de atividade física e o Instrumento de Avaliação da qualidade de vida (WHOQOL-Bref).

RESULTADOS: A idade média foi de 42,39±2,10 anos, com predomínio do sexo masculino e o índice de massa corporal médio foi de 27,55±0,76. Níveis de atividade física predominantes foram entre moderado a alto. O sexo masculino apresentou níveis significativamente mais elevados de atividade física vigorosa ($p=0,033$) e maiores escores no WHOQOL-Bref, quando comparado ao sexo feminino.

CONCLUSÃO: Quanto maiores os níveis de atividade física desta população com deficiência visual, melhor a qualidade de vida. Os participantes tiveram uma predominância de atividade física moderada a alta, e o sexo masculino apresentou níveis maiores de atividade física em atividades vigorosas, quando comparado ao sexo feminino.

UNITERMOS: Exercício; deficiência visual; pessoas com deficiência; qualidade de vida.

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Abbreviations: BMI, body mass index; CI, confidence interval; HP, hip circumference; IPAQ short form, International Physical Activity Questionnaire short version; VI, Visual Impairment; WC, waist circumference; WHOQOL-Bref, Quality of Life Assessment Instrument; WHR, waist to hip ratio.

BACKGROUND

The visual impairment (VI) is characterized by a condition of low vision or blindness, which may result from a disease, trauma, congenital or degenerative condition [1,2]. Both moderate and severe VI are grouped and classified as low vision, which together with blindness represents all vision impairments [3].

Estimates say that there are about 285 million visually impaired people in the world, of whom 39 million are blind [4]. VI seems to have a substantial impact on an individual's health-related quality of life compared to other chronic conditions such as type II diabetes and hearing impairment [5]. It can significantly reduce participation in social, religious, mobility, visually intensive tasks, daily and work-related activities [6-9].

Regular physical activity for at least 150 minutes of moderate degree per week or 75 minutes of vigorous activity per week is recommended to maintain good health and reduce the risk of mortality, and diseases, in a variety of organs of the system [10-18]. Despite these benefits, almost one-third of the adult population worldwide does not engage in physical activity, therefore, physical inactivity should be considered a global public health issue [16].

Physical inactivity is also known as a major problem among people with disabilities, especially VI, since they have difficulty accessing recreational and athletic programs and getting help in the development of adequate and safe physical recreation habits [19,20].

It is believed that people with VI tend to have fewer active lifestyles and become more susceptible to diseases related to physical inactivity [21,22]. This may be related to barriers found in the non-inclusive practice of physical activity [23]. In this sense, the limitation in the participation of the physical activity can be related to the dependence of the help of others to be able to carry out the activity and the lack of accessibility in the neighborhood [24]. Besides that, loss of vision is also a limiting factor in the basic activities of daily living and can negatively influence quality of life, since VI requires a restructuring of these activities, such as bathing, dressing and some instrumental tasks [25].

In this sense, studies suggest that the low level of physical activity and sedentary behaviors can affect the quality of life [26,27]. Besides that, previous studies have demonstrated the influence of demographic factors on the practices and intensity of physical activity. However, there are still gaps in the evidence on physical activity habits and the relationship with quality of life in people with VI. Thus, this study sought to verify the relationship between physical activity habits and the quality of life of people with VI.

METHODS

It is a cross-sectional, analytical, quantitative and exploratory descriptive study. The research was carried out at the *Instituto dos Cegos da Paraíba Adalgisa Cunha*, located in the municipality of João Pessoa, Paraíba state. The volunteers who agreed to participate in the research provided written consent. This work was published by the Research Ethics Committee of the State University of Paraíba under protocol nº 2.434.275.

Subjects

The sample was non-probabilistic by accessibility, composed of 53 volunteers with visual impairment, practicing or not practicing habitual physical activity, who attended the *Instituto dos Cegos da Paraíba Adalgisa Cunha*.

The following inclusion criteria were considered: (1) Have uncorrected visual impairment (partial or total); (2) Be over 18 years of age; (3) Agree to participate in the survey. The following exclusion criteria were considered: (1) To have associated neurological or cognitive comorbidities; (2) Possess physical limitations of trauma-orthopedic or rheumatological origin; (3) Chemical dependency.

Instruments

The Clinical and Sociodemographic Assessment Sheet was used to characterize the participants, including gender, age, schooling, marital status, social data and occupational activities, among other characteristics as body mass index (BMI), waist circumference (WC), hip circumference (HP), waist to hip ratio (WHR) and arterial blood pressure. The International Physical Activity Questionnaire short version (IPAQ short form), validated for the Brazilian population was used to evaluate physical activity

habits [28]. The IPAQ is an instrument that assesses physical activity habits during the usual week period, which include vigorous or moderate activities performed as an exercise or as an occupational activity. Its short version consists of 8 questions that can be answered through an evaluator.

In order to measure quality of life, the Quality of Life Assessment Instrument (WHOQOL-Bref), created by the World Health Organization in 1996, comprises 26 items, where, the first two are related to the life and the other 24 related to physical, psychological, social and environmental factors. It has the score of 01 to 05 points, where the highest one is related to a better quality of life [29].

Statistical analysis

Data were expressed in percentage, mean and standard error of the mean. With the help of a statistician, the inferential analysis was done through the IBM SPSS Statistics 20 and GraphPad Prism 5.0 Statistical software. To verify the normality of the data, the Kolmogorov Smirnov test was used. To compare the variables according to sex, the student's t test was used. For the correlation between physical activity habits and quality of life variables, the Pearson correlation test was used. Linear regression was used to quantify the relation between quality of life and physical activity. The confidence interval (CI) was 95%. In all analyzes, the significance level corresponding to $p < 0.05$ was considered.

RESULTS

The sample consisted of 53 individuals with visual impairment, with a mean age of 42.39 ± 2.10 years. There was a predominance of males, single individuals and incomplete scholary (Table 1). The majority of the participants walked with cane and had visual impairment in both eyes. The mean time of vision impairment was 29.92 ± 2.37 years, and the mean systolic blood pressure was 121 ± 1.19 and diastolic 83 ± 1.28 mmHg. The mean Body Mass Index (BMI) was 27.55 ± 0.76 , showing a high prevalence among individuals with pre-obesity. The mean waist-hip ratio for males was 0.923 ± 0.013 and for females 0.855 ± 0.027 (Table 2).

When comparing all domains of quality of life between the sexes, using the WHOQOL-bref, it can be observed that male sex obtained significantly higher scores than the female sex, in areas of physical, psychological and environmental health (Table 3).

Table 1. Sociodemographic characteristics of individuals with visual impairment from the Instituto dos Cegos da Paraíba Adalgisa Cunha.

Variables	n (%)
Gender	
Male	33 (62.3)
Female	20 (37.7)
Marital Status	
Single	30 (56.6)
Married	14 (26.4)
Divorced	7 (13.2)
Widower	2 (3.8)
Scholarity	
None	2 (3.8)
< 8 years	14 (26.4)
= 8 years	7 (13.2)
> 8 < 11 years	8 (15.1)
= 11 years	9 (17)
> 11 < 15 years	4 (7.5)
≥ 15 years	9 (17.0)

Table 2. Clinical and anthropometric characteristics of individuals with visual impairment at the Instituto dos Cegos da Paraíba Adalgisa Cunha.

Variables	Sample Description
Walking mode*	
Without help	15 (28.3)
Cane	31 (58.5)
Human guide	7 (13.2)
Vision impairment laterality*	
Right	0 (0)
Left	1 (1.9)
Both	52 (98.1)
Time of vision impairment [†]	29.92 ± 2.37
Arterial Pressure (mmHg) [†]	
Systolic	121.13 ± 1.19
Diastolic	83.01 ± 1.28
Body Mass Index [†]	27.55 ± 0.76
Waist circumference [†]	
Male	96.03 ± 1.98
Female	86.60 ± 4.10
Hip circumference [†]	
Male	103.87 ± 1.33
Female	100.95 ± 2.72
Waist to hip ratio [†]	
Male	0.923 ± 0.013
Female	0.855 ± 0.027

* Number of participants(%); [†] Mean \pm standard error of the mean.

Table 3. Comparison of Quality of Life domains between the sexes, using the WHOQOL-bref.

Domain	Sample*	Male*	Female*	p [†]
I. Physical Health	16.31 ± 0.41	17.11 ± 0.48	14.99 ± 0.67	0.018
II. Psychological	18.50 ± 0.43	19.20 ± 0.52	17.36 ± 0.72	0.041
III. Social relationship	20.90 ± 0.75	21.93 ± 0.87	19.20 ± 1.31	0.106
IV. Environment	15.11 ± 0.32	15.71 ± 0.40	14.13 ± 0.47	0.033
Total Score	52.18 ± 1.07	54.90 ± 1.24	47.70 ± 1.53	0.001

* Mean \pm Standard error of the mean; [†]: Comparison by the sex variable.

In comparison between the sexes and habits of physical activities, according to IPAQ short form, the total mean of the individuals' physical activity was 3606.50 ± 2460.50 MET – minutes per week. In addition, the population performance was predominant in moderate to high physical activity. Male sex, in comparison to female sex, presented higher levels of physical activity, especially in vigorous activities (Table 4).

In the correlations between quality of life and total IPAQ short form scores, it can be observed that the higher the physical activity levels of visually

impaired individuals, the better the quality of life in all WHOQOL-bref domains. When correlating physical exercise intensity and quality of life, participants who performed more vigorous and moderate exercises presented better scores on the WHOQOL-bref (Table 5).

The linear regression shows a significant influence of physical activity on quality of life ($R^2=0.3368$; $P<0.0001$) (Figure 1). Besides, vigorous intensity exercises show to have an influence on better quality of life aspects (Figure 2).

Table 4. Comparison of physical activity habits between the sexes according to IPAQ short form.

Physical activity intensity	Total frequency	Male	Female	p*
Categories, n (%)				
High	21 (39.6)	14 (26.4)	7 (13.2)	
Moderate	23 (43.4)	14 (26.4)	9 (17)	
Low	9 (17)	5 (9.4)	4 (7.5)	
MET – minutes per week (mean \pm SEM)				
Vigorous	1383.39 ± 199.47	1762.42 ± 289.28	758.00 ± 151.58	0.033
Moderate	849.43 ± 133.48	830.90 ± 112.42	880.00 ± 306.62	0.159
Walking	1371.67 ± 191.35	1353.00 ± 251.07	1402.50 ± 300.50	0.717
Total Score	3606.50 ± 2460.50	3946.33 ± 2552.28	3040.50 ± 2249.47	0.222

* p: Comparison according to gender; MET: Metabolic equivalent; SEM: Standard error of the mean.

Table 5. Correlation, (r) and p-values between WHOQOL-bref domains and IPAQ short form for individuals (N=53) with visual impairment.

		IPAC short form Total score	WHOQOL-Bref Total score	IPAC short form			WHOQOL-Bref			
				Vigorous Physical Activity	Moderate Physical Activity	Walking	Physical Healthy	Social Relationship	Environment	
WHOQOL-Bref Total score	r	.580								
	p-value	.000								
IPAC short form	Vigorous Physical Activity	r	.754	.586						
		p-value	.000	.000						
	Moderate Physical Activity	r	.612	.265	.409					
		p-value	.000	.056	.002					
	Walking	r	.553	.229	.005	-.042				
		p-value	.000	.099	.971	.766				
WHOQOL-Bref	Physical Healthy	r	.414	.833	.379	.230	.176			
		p-value	.002	.000	.005	.098	.208			
	Psychological	r	.469	.886	.494	.378	.051	.764		
		p-value	.000	.000	.000	.005	.717	.000		
	Social Relationship	r	.353	.692	.343	.242	.097	.716	.754	
		p-value	.010	.000	.012	.081	.491	.000	.000	
	Environment	r	.372	.710	.408	.029	.211	.540	.515	.400
		p-value	.006	.000	.002	.837	.130	.000	.000	.003

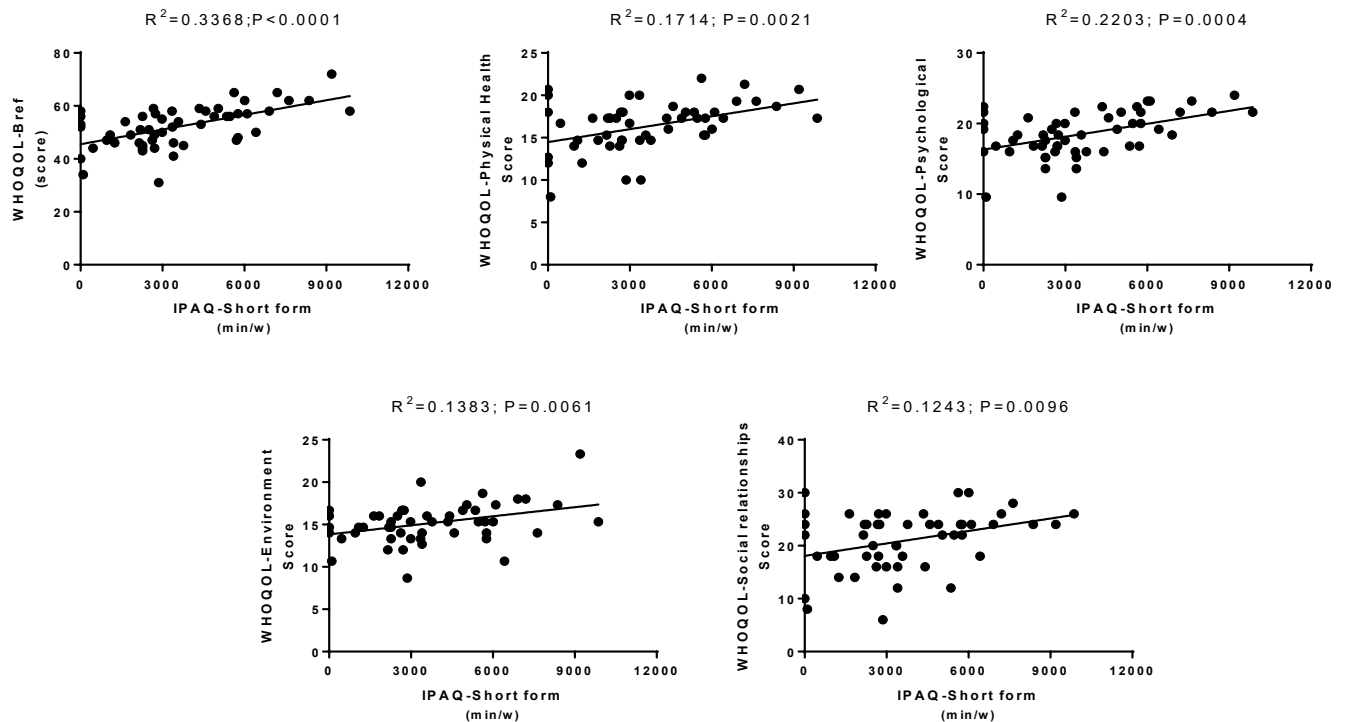


Figure 1. Linear regression between all WHOQOL-bref domains and IPAQ short form total scores.

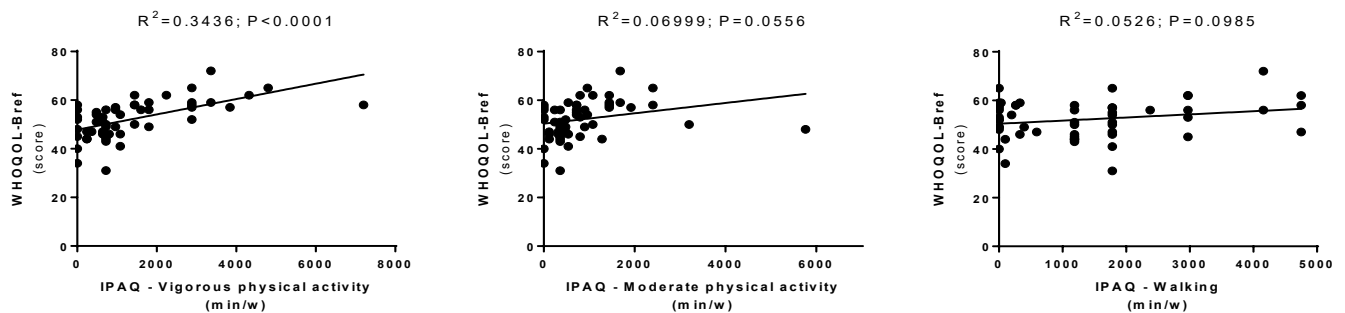


Figure 2. Linear regression between WHOQOL-bref total scores and physical exercise intensity, according to the IPAQ short form.

DISCUSSION

The purpose of this study was to provide physics and quality of life data for people with visual impairment. Participants showed moderate to high levels of physical activity being greater significance in males. In addition, the higher and more intense levels of physical activity in this population, the better quality of life.

In this study, there was a predominance of males, walking with walking stick and having both eye involvement. VI affects people of all ages and both sexes [30, 31]. Previous studies are largely inconclusive as to the relation of sociodemographic factors in adults

with VI, which show a high prevalence in both males and females [31-33].

It is observed in this study that the sample consisted of adults with mean BMI classified as pre-obese. In the same sense, the Haegele et al. study evaluated 147 individuals with visual impairment of average age of 44.33 ± 15.3 years and observed that the mean BMI was 27.59 ± 6.52 , within a variance of overweight individuals. Another study showed that 73.1% of the individuals with VI evaluated were overweight [33].

Physical activity levels were considered moderate and high in the study population. These results are in agreement with studies that show participants with VI were physically active in moderate to vigorous

activities, however, it is important to observe issues that involve sedentarism in this population [34]. Nutrition co-variables weren't controlled in our study. As it's possible that they influence directly the population's BMI, they could explain the pre-obese classification result. Besides that, the IPAQ short form is a self-report instrument and can present memory and observation bias.

Previous studies have shown divergent results in the levels of physical activity between male and female with VI. While some indicate that there are no significant differences in physical activity levels between men and women, others report that males were more active and participatory in physical activities than females [9, 35]. The latter corroborate with the results found in the present study, where men presented higher levels than women, mainly in vigorous activities. However, it should be considered that in our sample there were more men than women, this may have impacted the results found.

On the other hand, many factors may explain the influence of sex on physical activity levels, for example, the type of physical activity performed, whether occupational or recreational, the mode and time spent in such activities [34]. Moreover, the activities developed in the work environment by men tend to promote a greater accumulation of minutes in occupational physical activities [36]. These results are consistent with other studies, which show that men are significantly more active than adult women with VI or without disability [34, 37].

VI has a significant impact on quality of life compared to other chronic conditions [5]. A study shows that, in general, individuals presented a mean score below the classification of the perceived quality of life assessment established for a Brazilian population with a 60-point cut-off score [38].

When evaluated by sex, men presented a better perception of the quality of life than women. In this sense, studies have shown that people with female VI have lower quality of life scores when compared to males [39].

In the present study it can be observed that higher levels of physical activity are related to a better perception in the 4 domains of quality of life evaluated by the WHOQOL-Bref. In line with these findings, previous studies have presented similar results where levels of physical activity can improve quality of life, when evaluated by self-report instruments [34, 40].

This study presented results on the levels of physical activity and quality of life in individuals with VI. Some limitations may be highlighted in sequence. Although the instruments used for evaluation are reliable and validated nationally and internationally, allowing direct and effective investigation of this population, these measures provide self-report data that can make the results more subjective. Another limitation is the non-inclusion of a control group without VI that could provide more concise results as to the influence of the investigated condition.

In conclusion, the higher the level of physical activity, the better the quality of life performance of the individuals studied. Showing that physical activity plays an important role in the quality of life especially in the motivational and environmental aspects, besides the benefits to physical health already known. It should be considered that the predominance of moderate to high physical activity in male when compared with the female, especially in vigorous activities, could be explained by the number of male individuals and the type of activity performed, such as, work activities. Future studies that include control group are needed to investigate physical activity habits and quality of life in people with visual impairment and could provide more concise results as to the influence of the condition investigated.

NOTES

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Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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