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BMI, Body Image, and Quality of Life—Moderating Role of Physical Activity

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Abstract: Body mass index (BMI) and body image (BI) are constructs worth examining in the context of physical activity (PA), and they are both related to quality of life (QoL). PA, BMI, and BI should all be considered as associated parameters, and their effect on QoL should be examined and understood. This study aimed to determine the moderating role of PA in the relationship of BMI and BI with QoL. The sample of examinees consisted of 500 respondents (307 women; aged 39 ± 6 years). A physical activity self-evaluation questionnaire (IPAQ-SF) was used to estimate PA; BI was evaluated by using the *Body Image Dimensional Assessment* (BIDA) questionnaire, while QoL was determined with the WHOQOL-BREF questionnaire. The results showed that vigorous PA moderates the relationship between BMI and social relationships in adults (Sig. = 0.000). Walking and vigorous PA affect the relationship between BMI and environmental health (Sig. = 0.017 and Sig. = 0.049, respectively). Both walking (Sig. = 0.035) and moderate PA (Sig. = 0.032) alternate the relationships between BI and social relationships. Walking (Sig. = 0.000) and vigorous PA (Sig. = 0.016) moderate the relationship between BI and environmental health. The influence of PA on the moderation of the relationship of BMI and BI with physical and psychological health in the working population was not statistically significant.

Keywords: BMI; body dissatisfaction; quality of life; modalities of physical activity; adults



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1. Introduction

Quality of life is a broad, multi-faceted construct that includes standards of living, health, productivity, the ability to maintain close contact, safety, community involvement, and a sense of certainty about the future [1]. The development of this concept was spurred on not only by an evolving recognition of the subjective factor, but also by the increasing prevalence of chronic health conditions (i.e., non-communicable diseases) requiring long-term treatment and lifelong care [2]. Insufficient physical activity is one of the leading factors influencing the occurrence of various non-communicable diseases [3]. An assessment of global and regional trends in insufficient physical activity indicates that physical inactivity is on the rise and that there are no indications of a slowdown in the near future [4]. This trend can also affect public health, given that there is evidence of the benefits provided by physical activity that can be registered in the cardiovascular system, various types of cancer, obesity, and diabetes [5,6]. In addition, regular physical activity contributes to improved mental health outcomes [7] and social [8] and emotional functioning [9]; it contributes to the improvement of fitness parameters [10] and, thus, the overall QoL [11].

However, some authors argue that the determination of whether physical activity enhances QoL is impossible because this construct cannot be effectively operationalized and assessed [12]. The positive associations between physical activity and perceptions of QoL vary depending on the domains of QoL assessed [13], as well as the intensity of physical activity [14]. Namely, in the working population, according to Puciato, Borysiuk, and Rozpara [15], physical activity of moderate and high intensity was positively associated with QoL, while in an elderly population, this association was only found with activities of moderate intensity [14,16]. Meanwhile, in the research of Slimani, Paravlic, Mbarek, Bragazzi, and Tod [17], the relations of total physical activity, activities of moderate and high intensity, and all domains of QoL were established.

Body mass index (BMI) is an indicator for health risk [18], and its relations with QoL were thoroughly examined in previous studies [11,19–21]. It was determined that BMI values have an impact on almost every aspect of QoL, with men having their best QoL at a BMI of 26.0 kg/m², while women have their best at a BMI of 24.5 kg/m² [22]. In addition, there is an inverse relationship between BMI and physical activity [23], whereby higher BMI means lower levels of physical activity [24] and vice versa, while information on the potential impact of physical activity on the relationship between BMI and QoL is missing.

Body image (BI) represents a multifaceted construct that includes one's thoughts, feelings, beliefs, and behaviors that are related to the body [25], and it can be positive or negative. Negative BI, in particular, has been identified as a major public health concern not only because it affects a majority of individuals in most socioeconomically developed settings, but also because of the deleterious outcomes associated with negative BI [26]. Physical activity is associated with BI in adults [27], and that association can be described as causal. Some authors stated that regular physical activity is positively correlated with BI, as well as that negative BI is associated with a lower level of physical activity and, as such, it is a barrier for taking part in physical activity [28]. Hausenblas and Fallon [29] stated that a physically active adult population had a positive BI and that, after the exercise cycle, the respondents ended up with a better BI. However, there is little information suggesting a possible impact of BI on QoL [30].

Because participation in physical activities frequently depends on BI [28], we can consider BI as an important construct that is worth examining in the context of physical activity and that a similar relationship exists between BMI and physical activity. Apparently, both parameters are related to QoL, and therefore, physical activity and BMI, as well as BI, should be combined as related parameters, and their effect on QoL should be determined and understood. However, there are no data in the literature describing physical activity as a moderator of the mentioned parameters, especially in working populations. A question arises as to how physical activity affects the relationship between BMI and BI, on the one hand, and QoL on the other. This study uses PA as a variable that may modify the relationships between BMI, BI, and QoL, which is the scientific contribution of this research. The relationships between these phenomena are explored in a method that has not been applied before.

Therefore, the aim of this study was to determine the moderating effect of physical activity on the relationship of BMI and BI with QoL. We hypothesize that different levels of PA will have a moderating effect on the relationships of BMI and BI with the domains of quality of life in a working population.

2. Materials and Methods

2.1. Sample of Respondents

The sample of respondents was selected from the working population [31] with an average age of 39 ± 6 (from 24 to 65 years). The total sample (calculated using Gpower) consisted of 500 respondents, of whom 193 were men and 307 were women. The sample was taken from the working population employed in secondary schools in the Republic of Srpska. The criterion for inclusion in the study was that the respondents were permanently employed and did not have major health issues. For example, persons with physical

disabilities and significant health issues (e.g., malignant tumors, dementia, Alzheimer's disease, etc.) were excluded from the study, as well as those with mental disorders. In addition, persons who were in the phase of recovery from acute illnesses were excluded. All respondents were fully informed about the study's procedures and of the possibility of withdrawal from the study at any time. Informed consent was obtained from all respondents involved in the study.

2.2. Measures and Procedures

The study's protocol was approved by the Ministry of Education and Culture of the Republic of Srpska (No. 07.05/059-354-1/21) and the Pedagogical Institute (07/2.01/03-614-103/21), and the testing was performed in accordance with the ethical standards of the Declaration of Helsinki [32]. Anthropometric measurements (body mass and body height) were taken by the authors in optimal climatic conditions, with the participants in their underwear, and according to the methods proposed by the International Biological Program [33], whereas their body height (in 0.1 cm) was determined with a Martin Anthropometer, and body mass (in 0.1 kg) was assessed with a digital scale (Omron BF511 (Kyoto, Japan)).

2.2.1. Body Mass Index

The body mass index is a statistical index that uses a person's body mass and height to define a person as underweight, normal weight, overweight, or obese. It is calculated by taking a person's body mass in kilograms and dividing it by their height in meters squared:

$$\text{BMI (kg/m}^2\text{)} = \text{Body mass (kg)}/\text{Body height}^2 \text{ (m}^2\text{)} \quad (1)$$

The number generated from this equation is then the individual's BMI value [34].

2.2.2. Body Image

Body image was assessed using the *Body Image Dimensional Assessment* (BIDA) questionnaire [35]. The BIDA questionnaire is based on the assessment of body silhouette images, which are used to evaluate the subjective and affective aspects of body image. The questionnaire consists of four items that are graded on a scale from 1.8 to 5.2. Based on the answers, three direct indices and the final result of the questionnaire were calculated:

- Body dissatisfaction $[(Q1 - Q2) \times 100/3.4]$ expresses the disparity between one's current and ideal body image;
- Sexual body dissatisfaction $[(Q1 - Q3) \times 100/3.4]$ reflects the disparity between one's existing body image and the most appealing figure for the opposite sex;
- Compared body dissatisfaction $[(Q1 - Q4) \times 100/3.4]$ expresses the disparity between the respondent's present body image and that of the majority of people within his/her sex and age.

The positive values of the index indicate that respondents currently rate their body image higher than idealized levels. The final result of the BIDA scale—the index of dissatisfaction with body image—is calculated as the mean of the absolute values of body dissatisfaction, sexual body dissatisfaction, and compared body dissatisfaction.

The BIDA questionnaire's validity and reliability were determined in several population groups [35,36].

2.2.3. Quality of Life

The assessment of QoL, i.e., its quantification, was realized with a shorter version of the WHOQoL questionnaire [37]. The questionnaire has been internationally validated [38] and contains items that are divided into four domains: physical health, mental health, social relations, and environmental health. The WHOQoL questionnaire generates precise ratings for each dimension of quality of life.

This questionnaire was developed based on the WHOQOL-100 questionnaire [38], that is, by summarizing a certain number of questions, the short-version questionnaire was reduced from 100 to 24 questions. Two more questions about overall QoL and general health were added to the final edition of the questionnaire, bringing the total number of questions to 26. The answers to each question were given on a five-point Likert-type scale, i.e., respondents were given the possibility of selecting one of the following options: (1) not at all, (2) a little, (3) a moderate amount, (4) very much, and (5) an extreme amount. A great number of studies have proven the WHOQoL-BREF questionnaire's reliability and validity [39–43].

2.2.4. Physical Activity

A questionnaire for self-assessment of physical activity—the *International Physical Activity Questionnaire Short Form* (IPAQ-SF) [44]—was used for the assessment of the physical activity (PA) level. This questionnaire was created to address the challenge of identifying the amount of PA at a worldwide level so that active and inactive respondents could be distinguished [45], as well as for the comparison of different populations. A short form of the IPAQ questionnaire estimates the frequency, duration, and intensity of PA in four domains as follows: (a) leisure-time PA, (b) household PA, (c) occupational PA, and (d) transportation PA. The questions in the IPAQ-SF questionnaire are structured to allow separate scoring for walking/low-intensity PA, moderate-intensity PA, and vigorous PA. The standardized scoring system for the IPAQ-SF was used to perform the data processing in this study (www.ipaq.ki.se, 12 June 2022). A metabolic equivalent of task (MET) was used to calculate the results for each of the three levels of PA listed with respect to minutes per day. Total weekly MET-minutes (MET-min/week) were calculated by adding MET-minutes for each level of PA intensity (walking/low intensity = 3.3 METs; moderate intensity = 4.0 METs; vigorous intensity = 8.0 METs). The reliability and validity of the IPAQ-SF questionnaire were found to be satisfactory [46,47].

2.3. Data Analysis

The basic parameters of descriptive statistics were calculated for each variable: the average value (Mean) and standard deviation (SD). The correlations between the BMI, BI, and QoL domains of the examined sample were determined by applying Pearson's correlation coefficient. The determination of the impact of physical activity as a moderator of BMI, BI, and QoL was carried out by applying hierarchical regression analysis. A moderating hierarchical regression was carried out by introducing a new variable into the regression equation in each subsequent step. The significance of the newly inserted variable's contribution was reflected in the percentage change in the explained variance of the criterion variable and was expressed using delta R^2 (ΔR^2). The significance of the change was tested with the F test. In the last step of the moderating regression analysis, a variable that was the result of multiplying the predictor and the assumed moderator was introduced. If the existence of a significant percentage change of explained variance was determined, it was concluded that the examined variable had a moderating effect on the ratio of the predictors and criteria. All of the data were processed using the statistical package in SPSS 20.0 (SPSS Inc., Chicago, IL, USA). The significance was set at the level of 0.05.

3. Results

Table 1 shows the values of the basic statistics. The sample of respondents had average BMI values that were slightly above the cut-off point value for normally nourished people. The index of dissatisfaction with body image was above zero (15.19 ± 11.38), which means that the current estimation exceeded the idealized figure.

Table 1. Descriptive statistics (*n* = 500).

Variables	Mean	SD
BMI (kg/m ²)	25.58	3.19
Body dissatisfaction	11.10	17.37
Sexual body dissatisfaction	12.61	20.18
Compared body dissatisfaction	−9.65	22.32
The index of dissatisfaction with BI	15.19	11.38
Physical health	86.45	8.36
Psychological health	81.81	9.70
Social relationships	80.16	13.33
Environmental health	70.50	11.87
Walking (MET-min/week)	1584.00	1248.35
Moderate PA (MET-min/week)	2449.21	2699.29
Vigorous PA (MET-min/week)	2959.37	2536.96

Legend: Mean—average value, SD—standard deviation, BMI—body mass index, BI—body image, PA—physical activity.

Table 2 shows the values of Pearson’s correlation coefficient for the BMI, body image, and quality of life domains of the tested sample. The dimensions of physical (Sig. = 0.026) and psychological health (Sig. = 0.005) had a negative correlation with BMI, which means that respondents with higher BMI values corresponded to lower scores in the domains of physical and psychological health within the quality of life assessment questionnaire.

Table 2. Relationships of BMI, body image, and quality of life.

Variables		Physical Health	Psychological Health	Social Relationships	Environmental Health
BMI	r	−0.16 *	−0.20 **	−0.08	0.05
	Sig.	0.026	0.005	0.251	0.477
The index of dissatisfaction with body image	r	−0.17 *	−0.14	0.06	0.04
	Sig.	0.022	0.065	0.407	0.615
Walking	r	0.04	0.22 **	−0.05	0.00
	Sig.	0.619	0.002	0.539	0.985
Moderate PA	r	0.02	0.22 **	0.03	0.15 *
	Sig.	0.773	0.003	0.723	0.045
Vigorous PA	r	−0.04	0.15 *	−0.24 **	0.04
	Sig.	0.627	0.043	0.001	0.604

Legend: r—Pearson’s correlation coefficient, Sig.—significance. * *p* < 0.05, ** *p* < 0.01.

The relationships of BMI, the index of dissatisfaction with body image, and modalities of physical activity with the quality of life domains are shown in Table 2. BMI was significantly correlated (although with a low and negative correlation) with physical (Sig. = 0.026) and psychological health (Sig. = 0.005). The index of dissatisfaction with body image was only statistically significantly (Sig. = 0.022) correlated with the physical domain of quality of life, and the correlation between variables was also weak and negative. The relationship between walking and psychological health was positive and low (Sig. = 0.002) as they were between moderate PA and psychological (Sig. = 0.003) and environmental health (Sig. = 0.045) and between vigorous PA and psychological Health (Sig. = 0.043) and social relationships (Sig. = 0.001).

By using a hierarchical regression analysis, the impact of physical activity as a mediator of BMI and quality of life was determined (Table 3). Only results that show that physical activity has a moderating impact are presented.

Table 3. Physical activity as a moderator of the relationships among BMI, social relationships, and environmental health.

	Variables	PA as a Moderator of Relationships between BMI and Social Relationships				PA as a Moderator of Relationships between BMI and Environmental Health			
		Beta	Sig.	R ² (sig ΔR ²)	Sig.	Beta	Sig.	R ² (sig ΔR ²)	Sig.
Model 1	BMI	−0.084	0.251	0.007	0.251	0.052	0.477	0.003	0.477
	BMI	−0.013	0.860			0.059	0.436		
Model 2	Walking	0.034	0.651	0.074	0.007	−0.011	0.891	0.025	0.321
	Moderate PA	0.142	0.070	(0.005)		0.161	0.045	(0.243)	
	Vigorous PA	−0.299	0.000			−0.038	0.656		
	BMI	−0.269	0.038			−0.304	0.024		
Model 3	Walking	−0.239	0.569			−1.032	0.019		
	Moderate PA	1.312	0.085	0.154		0.167	0.833	0.088	
	Vigorous PA	−2.866	0.000	(0.001)	0.000	−1.352	0.051	(0.007)	0.018
	BMI x Walking	0.289	0.500			1.073	0.017		
	BMI x Moderate PA	−1.152	0.133			0.020	0.980		
	BMI x Vigorous PA	2.691	0.000			1.410	0.049		

Legend: PA—physical activity, BMI—body mass index, **Beta**—standard partial regression coefficient of each predictor variable on the criterion, **Sig.**—level of significance, **R²**—coefficient of multiple determination of the variable and predictor system.

Table 3 shows the moderating effect of physical activity on the relationship of BMI and QoL. Body mass index was not confirmed as an individual predictor of the domains of quality of life (social relationships and environmental health). This was also evidenced by the small number of statistically significant relationships between BMI and the domains of quality of life (Table 2). Table 3 shows that only between 0.3% and 0.7% of the variance of environmental health and social relationships, respectively, could be explained by the BMI. By introducing the variables of different levels of PA, the models provided a better and statistically significantly increased explanation, reaching up to 2.5% for environmental health and 7.4% for social relationships. With the introduction of the interaction variables, which were mathematical products of the values of different modalities of PA and BMI, the explanation ascended to 8.8% and 15.4% in the case of the domains of environmental health and social relationships, respectively. The moderating effects of different modalities of PA were investigated by using the interaction factors. The significance of ΔR² for the domains of environmental health (Sig. = 0.007) and for social relationships (Sig. = 0.001) was established, which meant that PA affected the relationships between BMI and the aforementioned QoL domains. The results showed that vigorous PA moderated (Sig. = 0.000) the relationship between the nutritional status (BMI) and the social relationships of adults, while low-level and vigorous PA moderated the relationship between BMI and environmental health in the sample of the working population.

Table 4 shows the moderating effect of physical activity on the relationship between BI and QoL.

The index of dissatisfaction with body image did not prove to be an individual predictor of the domains of quality of life (social relations and environmental health). This was clearly evidenced by the fact that a statistically significant correlation of the body dissatisfaction index existed only with the physical health domain of quality of life (Table 2). Table 4 shows that only between 0.1 and 0.4% of the variance in environmental health and social relationships, respectively, could be explained by BI. By introducing the variables related to different aspects of PA, the models provided a better and statistically significantly increased explanation, reaching up to 2.4% for the domain of environmental health and 7.8% for the domain of social relationships in QoL. With the introduction of the interaction variables, which were a mathematical product of the values of different modalities of PA and the index of dissatisfaction with one’s own body, the explanation ascended to 12.5% for environmental health and 11.9% for social relationships. The moderating effects of different modalities of PAs on the relationships of the dimensions of QoL, on the one hand, and, on the other, the index of dissatisfaction with BI, were investigated by adding these interaction factors. The existence of the significance of ΔR² for environmental health (Sig. = 0.000) and

for social relationships (Sig. = 0.041) was determined, which meant that PA affected the relationship between BI and these QoL domains. The results showed that both walking (Sig. = 0.035) and moderate PA (Sig. = 0.032) moderated the relationship between BI and social relationships in adults, while walking (Sig. = 0.000) and vigorous PA (Sig. = 0.016) moderated the relationship between BI and environmental health in the sample of the working population.

Table 4. Physical activity as a moderator of the relationships of BI with social relationships and environmental health.

	Variables	PA as a Moderator of Relationships between BI and Social Relationships				PA as a Moderator of Relationships between BI and Environmental Health			
		Beta	Sig.	R ² (sig ΔR ²)	Sig.	Beta	Sig.	R ² (sig ΔR ²)	Sig.
Model 1	The index of dissatisfaction with BI	0.061	0.407	0.004	0.407	0.037	0.615	0.001	0.615
Model 2	The index of dissatisfaction with BI	0.067	0.353	0.078 (0.003)	0.005	0.044	0.550	0.024 (0.243)	0.350
	Walking	0.042	0.574			−0.002	0.978		
	Moderate PA	0.146	0.060			0.157	0.049		
	Vigorous PA	−0.305	0.000			−0.023	0.782		
Model 3	The index of dissatisfaction with BI	−0.029	0.830	0.119 (0.041)	0.002	−0.113	0.398	0.125 (0.000)	0.001
	Walking	−0.198	0.137			−0.453	0.001		
	Moderate PA	0.410	0.005			0.136	0.345		
	Vigorous PA	−0.358	0.009			0.291	0.033		
	The index of dissatisfaction with BI x Walking	0.312	0.035			0.585	0.000		
	The index of dissatisfaction with BI x Moderate PA	−0.364	0.032			0.031	0.855		
	The index of dissatisfaction with BI x Vigorous PA	0.150	0.356			−0.394	0.016		

Legend: PA—physical activity, BI—body image, **Beta**—standard partial regression coefficient of each predictor variable on the criterion, **Sig.**—level of significance, **R²**—coefficient of multiple determination of the variable and predictor system.

4. Discussion

The findings of this study were rather unexpected. First and foremost, all associations determined between the PA modalities and QoL domains, whether they were statistically significant and positive or negative, were weak (less than 0.25). Furthermore, even the statistically significant associations differed from those established in previous research. Thus, no statistically significant associations were found between physical activity and physical health, contrary to the findings from earlier studies [14,48]. The data would be more understandable if the respondents were young, but this was a sample of middle-aged individuals. On the other hand, all modalities of physical activity were positively associated with psychological health as a subdomain of quality of life, which is encouraging. Along with mental health, moderate PA was positively associated with the environmental health domain, while vigorous PA was negatively associated with social relationships (weak association). The lack of association between physical activity and environmental health is understandable, since this domain refers predominantly to (objective) socio-economic parameters, which individual PA cannot influence. The fact that vigorous PA was negatively related to the domain of social relationships indicates that it is necessary to identify those activities and determine whether or not they are socially interactive in character (long lasting, individual in nature), which could not be determined by using the selected questionnaires.

Both BMI as an objective assessment and BI as a subjective assessment of body status were positively related to physical health, which was consistent with the findings of previous studies [11,21], but only BMI was associated with the psychological health domain. This association was expected—with the increase in obesity and a negative image of one’s

own body, the perception of satisfaction with physical health will also decrease. It is important to note that these weak correlations between the research variables, which were assumed based on previous studies and common sense, justified more statistical analyses, and that it was critical to examine whether the impact of PA on observed variables could be moderating.

The results referring to the moderating effects of vigorous physical activity showed that it reversed the impact of BMI on quality of life. In respondents in whom vigorous PA was not pronounced, the impact of BMI on the quality of social relationships was negative. Thus, respondents with higher BMI values had a lower quality of social relationships than respondents with lower BMI values [49,50]. In subjects with pronounced high-intensity PA, the impact of BMI was positive, so subjects with higher BMI values had a better quality of life than subjects with lower BMI values.

Engagement in physical activity of both high and low intensity (walking) was a moderator of the relationship between BMI and the perception of the quality of the environment in which the working people lived. However, the nature of that influence was the opposite. In workers in whom high-intensity physical activity was pronounced, the impact of BMI on the perception of environmental quality was negative, i.e., workers with higher BMI values had a lower quality of life than workers with lower BMI values. On the other hand, workers with prominent low-intensity physical activity had a greater and more positive impact of BMI on the perception of environmental quality, i.e., workers with higher BMI values had a significantly better quality of life than workers with lower BMI values. In workers with less pronounced high-intensity physical activity, the impact of BMI was stronger and positive (workers with higher BMI values had a better quality of life than workers with lower BMI values), and in workers with less pronounced high-intensity physical activity, the impact of BMI was weaker and negative (workers with higher BMI values had a poorer quality of life than workers with lower BMI values). The data obtained on the moderating effects of different modalities of PA on the relationship between BMI and QoL show the complexity of the impact of PA and clearly suggest that, when recommending the type of PA that should be introduced to a working population, many factors (medical, physical, and socio-psychological) must be taken into account, and dealing with that PA could really lead to a change in the quality of life.

When it came to the moderating role of different modalities of physical activity on the relationships of BI with aspects of quality of life, it was found that engaging in moderate physical activity reduced the influence of dissatisfaction with the body on social relationships. In the case of working respondents who did not engage in moderate physical activities, the influence of body dissatisfaction on social relationships is greater.

Among respondents for whom walking was more prominent as a modality of PA, the positive impact of BI on the quality of social relationships was greater. In workers who walked less, the impact of BI was weaker and negative (workers who were dissatisfied with their bodies had a slightly lower quality of life than workers who were less dissatisfied with their own bodies). The findings in Table 4 further suggest that engaging in moderate physical activity reduces the impact of body dissatisfaction on social relationships. In working individuals who participated in moderate physical activity less, the impact of dissatisfaction with the body on social relationships was stronger.

On the other hand, more intensive practice of walking as a modality of PA increased the impact of BI on the perception of environmental quality. In working respondents for whom walking was more pronounced, the influence of body dissatisfaction on the perception of the quality of the living environment was greater. In workers with less pronounced physical activity of walking, the influence of dissatisfaction with the body was weaker. The study by Faro, Whiteley, Haiman, and Napolitano came to similar results [51]. These results are especially interesting because walking as a modality of physical activity, according to previous research [16], is the most important in the older adult population.

Engaging in vigorous physical activity increased the impact of BI on the perception of the quality of the environment. In working respondents in whom engaging in vigorous

physical activity was pronounced, the impact of BI on the perception of environmental health was greater. In working individuals with less pronounced vigorous physical activity, the impact of BI was weaker.

Previous research confirmed undoubted associations between quality of life, physical activity, and health. The scientific contribution of this research is that the relationships between these phenomena were studied in a way that has not been applied so far—physical activity was seen as variable that can alter the relationships between BMI, BI, and QoL. As it was conceived in this way and conducted on a representative sample using more complex statistical techniques, this research enables the results and the conclusions drawn therefrom to be more reliable and important for the understanding of the role of physical activity than the results of most classical correlation studies.

Planning and executing programs aimed at enhancing the health and quality of life of individuals of various ages depend on understanding the impacts of various modalities of physical activity.

5. Conclusions

Based on the results obtained here, it can be concluded that vigorous PA and walking as a modality of physical activity have moderating effects on the social relationship and the environmental health domains of QoL. Physical activity of a moderate intensity only showed a moderating effect between BI and social relationships. Physical activity did not have a statistically significant mediating effect on the association of BMI and BI with physical and mental health, the two dimensions of quality of life. Future studies should identify the exercise programs that would have a moderating effect on the aforementioned variables. Future studies must segment the sample of the working population into age-appropriate groups, with a recommended age range of ten years, as well as by respondents' gender, which is a crucial factor in determining physical activity. Future research must also take into account the moderating effects of various forms of physical activity among respondents with varying levels of education, socioeconomic status, cultural and racial features, and lifestyles.

6. Limitations of the Study

The study's weaknesses were mostly attributable to the variability of the sample of the working population. Another limitation of the study is that it excluded consideration of gender as an important determinant of PA, as well as body image. The respondents' socio-psychological factors were also left out of the study. It would be useful to include respondents' level of education, financial situation, and cultural and ethnic traits, as well as some health-related behaviors (consumption of alcohol, cigarettes, etc.).

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