

A 6-month comparison of quality of life and mood states between physically active and sedentary college students

Uma comparação durante seis meses da qualidade de vida e estados de humor entre universitários fisicamente ativos e sedentários

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ABSTRACT

Physical inactivity has been described as one of the major public health problems of the 21st century. Physical activity plays an important role in reducing the prevalence of sedentarism, improving the quality of life and improving individuals' mental health.

Objective: This study aimed to perform a 6-month comparison of quality of life (QOL) and mood states (MS) between physically active and sedentary college students.

Methods: A sample of 32 individuals completed questionnaires to assess their level of physical activity, quality of life and mood states. They were separated into two groups: sedentary (n=15) and physically active (n=17). The International Physical Activity Questionnaire (IPAQ) was used for assessing PA levels, the WHO Quality of Life-BREF for QOL and the Brazilian Mood Scale for MS. We used factorial analysis of variance with repeated measures and post-hoc Tukey test ($p \leq 0.05$) for QOL and MS inferential analysis.

Results: QOL was significantly higher for the physically active group in Environment and Social Relationships domains. Similarly, MS showed increased scores in Vigor dimension for the physically active group after six months.

Conclusions: These results suggest PA can positively influence aspects of an individuals' quality of life. However, our data did not show a significant influence of PA on mood states.

Keywords: Quality of Life. Mood Disorders. Physical activity. Sedentary Lifestyle.

RESUMO

A inatividade física tem sido descrita como um dos principais problemas de saúde pública do século XXI. Neste contexto, a atividade física desempenha um papel importante na redução da prevalência de sedentarismo, melhorando a qualidade de vida e a saúde mental dos indivíduos.

Objetivo: Este estudo teve como objetivo analisar a influência de seis meses de atividade física (AF) na qualidade de vida (QV) e estados de humor (EH) de adultos jovens.

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Métodos: Uma amostra de 32 indivíduos completou uma bateria de questionários para avaliar o seu nível de atividade física, qualidade de vida e estados de humor. Eles foram separados em dois grupos: sedentários ($n = 15$) e fisicamente ativos ($n = 17$). O International Physical Activity Questionnaire (IPAQ) foi utilizado para avaliar os níveis de AF, o WHO Quality of Life-BREF (WHOQOL_Bref) para QV e a Escala Brasileira de Humor (BRAMS) para os EH. Foi realizada análise fatorial de variância com medidas repetidas e teste post-hoc de Tukey ($p \leq 0,05$) para QV e análise inferencial para os EH.

Resultados: Escores de QV foram significativamente maiores para o grupo fisicamente ativo nos domínios ambiental e social. Da mesma forma, EH apresentaram maiores escores na dimensão Vigor para o grupo fisicamente ativo depois de seis meses, sem contudo, atingir os níveis de significância estatística.

Conclusões: Estes resultados sugerem que AF pode influenciar positivamente aspectos na qualidade de vida do indivíduo. Contudo, os dados não evidenciam uma influência significativa da AF nos estados de humor.

Palavras-chave: Qualidade de Vida. Transtornos do Humor. Atividade física. Sedentarismo.

Introduction

Physical inactivity has been described as one of the major public health problems of the 21st century.¹ Reliance on technology can diminish the body's energy consumption during daily activities, increasing the incidence of sedentarism.² In this context, being physically active plays an important role in³ improving quality of life⁴ and mental health.⁵

Physical activity is defined as any body movement that spends energy above resting levels.⁶ According to a large number of publications, being regularly active improves the quality and length of life.⁷⁻¹⁰ Regular physical activity can lower the risk of mortality, cardiopathies⁸, strokes, hypertension, type II diabetes, osteoporosis, obesity, colon cancer and breast cancer.^{2,11} Exercise also reduces anxiety, depression¹², cognitive decline¹³ and stress levels, and improves overall well-being and mental energy.^{14,15,16} Physical activity programs have been suggested as a necessary course of action to promote healthy lifestyles and a better quality of life.^{17,18,19}

Although "quality of life" is frequently used in medical literature, a consensus about its meaning is not yet realized.^{20,21} It has been described as the self-perception of one's position in life which considers personal goals, expectations, standards and concerns. This definition incorporates aspects related to physical health, psychological state, level of independence, sociocultural and environmental relationships, and personal beliefs.^{22,23} In various populations, higher number of friends, financial sta-

tus and education are associated with increased life satisfaction.²⁴

Psychological factors are also of great importance for the perception of quality of life. According to McNair *et al.* (1992) and Lane (2007), understanding a person's psychological aspects requires not only the inclusion of physiological and behavioral data but also special attention to mood states and mood swings. Regular physical activity is described as a positive contributor to the improvement of quality of life, energy level and mood states.^{8,26}

Brazilian Mood Scale (BRAMS) was considered an appropriate sports psychology instrument for assessing mood profiles through a short questionnaire.²⁷ Sports psychology instruments are useful for early identification of problems both in the team and team's staff mood states.²⁸ Moreover, it monitors emotional responses to injury, performance prediction, and overtraining rehabilitation.²⁸⁻³³ Psychometric instruments may have their application extended to a non-athlete population, from teenagers to adults, either for mood states or training workload assessment.³⁴⁻³⁶

In this context, this study aimed to perform a 6-month comparison of quality of life and mood states between physically active and sedentary individuals.

Material and methods

College students over 18 years old in good health were included. Individuals who were previously diagnosed with chronic diseases, did not com-

plete the questionnaires for six months, or changed their physical activity status during the study were excluded.

Our sample recruitment method consisted of printed advertisement and oral presentations in class at the Universities, which were chosen by convenience, in a total of four private Universities. Those who were interested in participating contacted the research team by phone, email or in person. After a detailed explanation about the study, volunteers had the informed consent signed. They were free to leave the study at any point.

We used the short version of the *International Physical Activity Questionnaire (IPAQ)*, an instrument validated for the Portuguese language by Matsudo *et al* (2001) for Brazilian subjects³⁷ in order to determine individuals physical activity levels. IPAQ classifies an individual as active if he or she engages in physical activity on a moderate or high intensity. An individual is considered sedentary if he or she is inactive or does not achieve moderate or intense levels of physical activity.³⁸ IPAQ has been used in several studies related to health and illness.³⁹⁻⁴² IPAQ is divided into five domains of physical activity, as follows: exercise during work time, exercise during domestic activities, exercise during sports, and sitting down. The level of physical activity is determined by the sum of the minutes spent in all the five domains, taking in consideration its intensity.

The WHOQOL_Bref questionnaire²² was administered to assess quality of life levels. The Brazilian validation of WHOQOL-BREF was accomplished in 2000 by Fleck *et al*. It is comprised of 26 questions, subjectively evaluating general quality of life (2 items) and 4 specific domains: physical health (7 items), psychological health (6 items), social relationships (3 items) and environment (8 items). Every question had a scale from 1 (very bad) to 5 (very good). All items were scored from 1 to 5, and 3 items (pain and discomfort, medication, negative feelings) were reversely coded. Averages of each domain were calculated and transformed into percentiles. The WHOQOL_Bref questionnaire has been used in both healthy^{43,44,45} and sick individuals.^{46,47}

The mood of the subject was determined by the Brunel Mood Scale in a version translated and validated for the Portuguese language – BRAMS.⁴⁸

It consists of 24 items to assess mood change in the six dimensions – tension, depression, anger, vigor, fatigue, and confusion. Data are assessed and interpreted in percentile scores.

We used IPAQ in order to establish both the active and sedentary groups. Volunteers filled out the WHOQOL_Bref (in the morning) and BRAMS (once in the morning and another at the end of the day) questionnaires once a month for six months.

This study was approved by the University Center of Belo Horizonte Ethical Committee in Research (060/2006).

Statistical Analysis

The questionnaire data was analyzed using both descriptive and inferential statistical methods.

For “quality of life” we used factorial analysis of variance with repeated measures. The factors were “group” (experimental and control – 2 levels) and “time” (six months – 6 levels). Since BRAMS was administered twice a day, we added another factor to the “mood states” analysis: “time of the day” (beginning of day and end of day – 2 levels).

A post-hoc Tukey test was performed for both “quality of life” and “mood states”. Significance was determined at $p \leq 0.05$, and the analysis was performed by the statistical package SPSS 18.0.

Results

Of 110 volunteers who presented to us, 82 met the criteria for inclusion. Fifty subjects were excluded because they either changed their physical activity status ($n=31$) or did not complete the questionnaires for six months ($n=19$). A total of 32 individuals completed the study, which included both men and women. They were categorized as sedentary ($n=15$) or physically active ($n=17$), and their ages ranged from 18 to 40 years (avg. 24.6 years). Physically active participants practiced dance, weight lifting or indoor cycling.

The data for active and sedentary groups throughout the 6 months will be presented in the charts below. The scores for General Quality of Life and specific domains (physical health, psychological health, social relationships and environment) are expressed as percentages.

Quality Of Life

The active group exhibited higher scores than the sedentary group. There was no significant difference between the groups for general quality of life, physical health and psychological health, when compared per month or per 6 months.

The active group showed significantly higher "Environment" scores during the 6 months ($p \leq 0.05$). The active group also showed significantly higher "Social relationships" scores in both the 1st and the 6th months ($p \leq 0.05$).

Mood States

Figures 2a-2f represent the analysis of each group's mood states (tension, depression, anger, vigor, fatigue, and confusion) at different times of the day (beginning or end).

Depression scores (Figure 2b) tended to be lower for the active group when compared to the

sedentary group. No significant difference was observed.

"Vigor" scores tended to decline at the end of the day in both groups (Figure 2d), although the active group exhibited higher scores in general. No significant difference was observed.

Fatigue scores increased at the end of the day for both groups (figure 2e), but the active group exhibited lower scores most of the time. No significant difference was observed.

Discussion

We found a positive relationship between physical activity and "social relationships" and "environment" scores for the active group. According to Soundy (2015), exercise can influence an individual's quality of life, providing an important sense of belonging and unity with others. Moreover, for those who enjoy sport, exercise provides a poten-

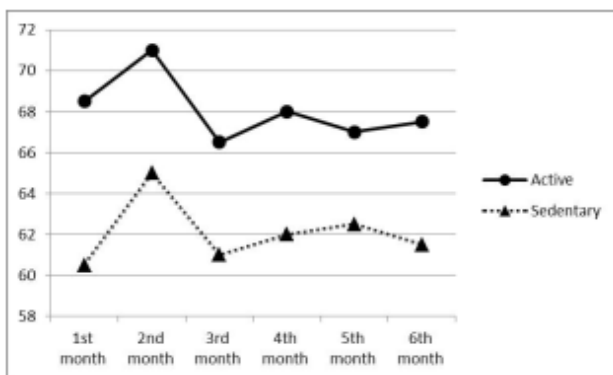


Figure1a: General quality of life scores for active and sedentary groups

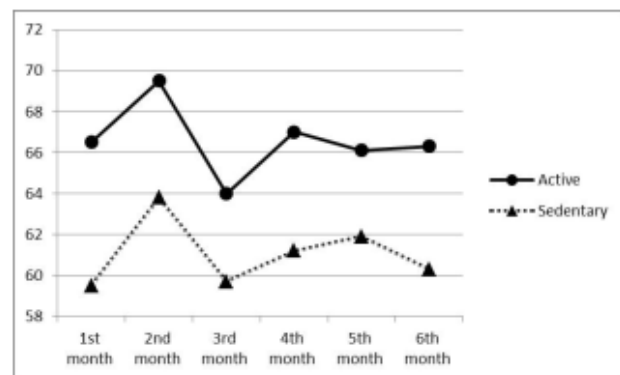


Figure1b: Physical health scores for active and sedentary groups

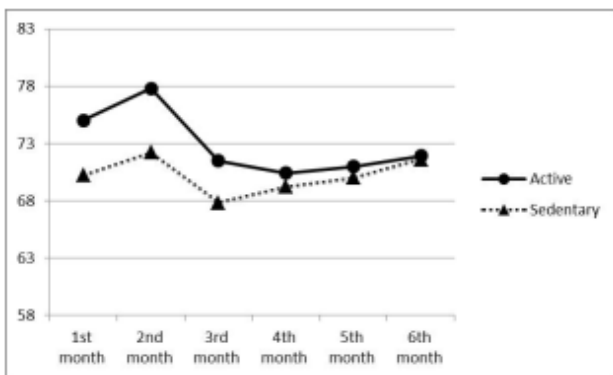


Figure1c: Psychological health scores for active and sedentary groups

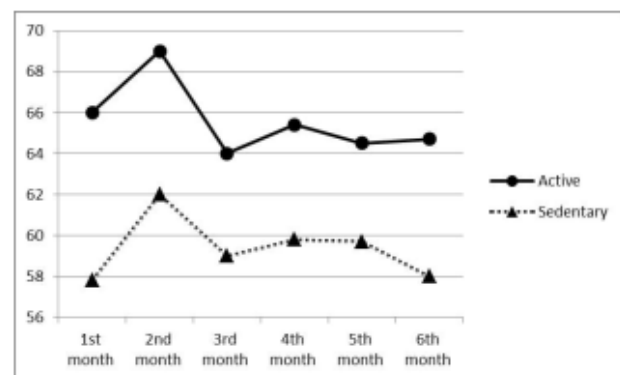


Figure1d: Environment scores for active and sedentary groups

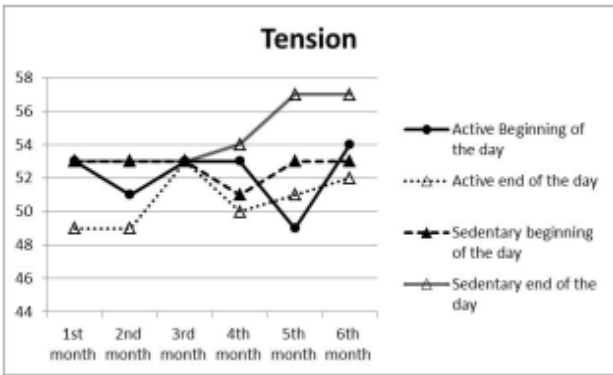


Figure 2a 'Tension' scores at the beginning and at the end of the day for active and sedentary groups

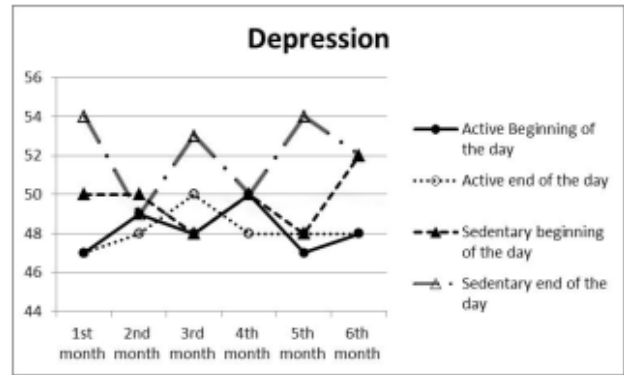


Figure 2b 'Depression' scores at the beginning and at the end of the day for active and sedentary groups

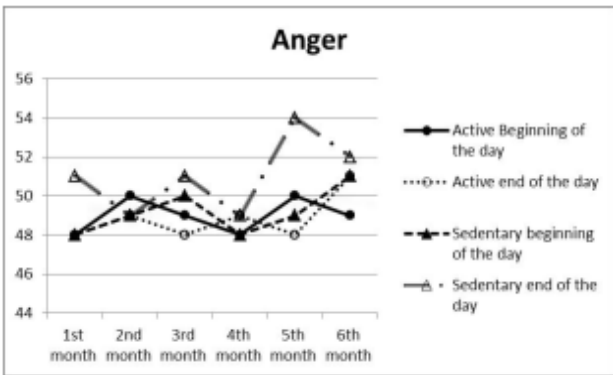


Figure 2c 'Anger' scores at the beginning and at the end of the day for active and sedentary groups

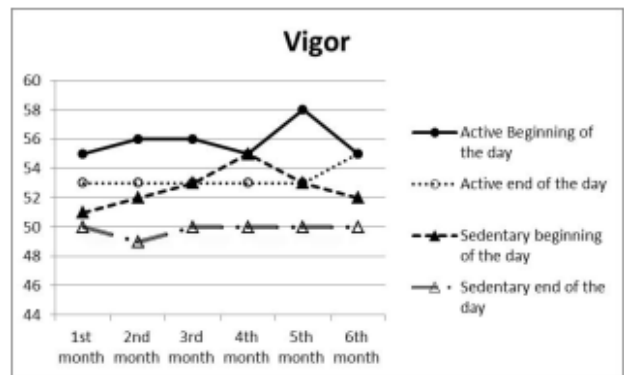


Figure 2d 'Vigor' scores at the beginning and at the end of the day for active and sedentary groups

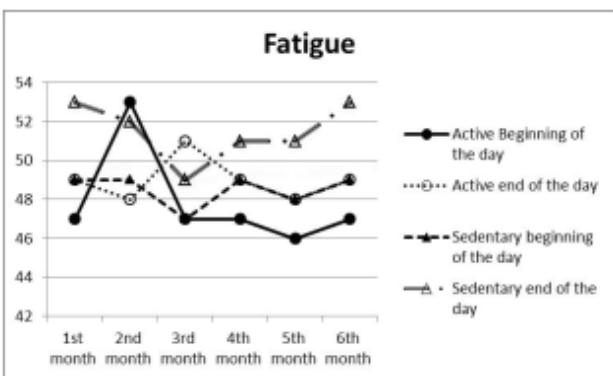


Figure 2e 'Fatigue' scores at the beginning and at the end of the day for active and sedentary groups

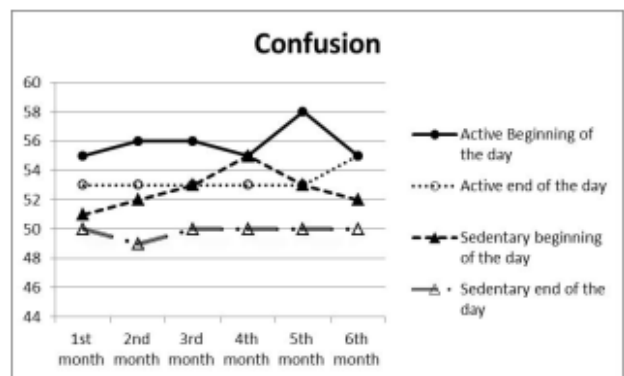


Figure 2f 'Confusion' scores at the beginning and at the end of the day for active and sedentary groups

tial to develop a positive identity, which may be central to health psychology changes for individuals.⁵⁰

Søltoft, Hammer and Kragh (2009) investigated the relationship between quality of life and Body Mass Index (BMI) among English men and women. Results showed a significant association between lower BMI and quality of life after controlling for factors such age, gender and obesity related co-morbidities. These data demonstrate the potential for physical activity to lower body mass index and consequently improve the quality of life.⁴⁹ Martin et al. (2009) aimed to demonstrate that physical exercise improves quality of life by testing 430 sedentary postmenopausal women for six months. Groups engaged in 50% or 100% or 150% of the recommended physical activity. Four physical aspects (physical functioning, limitations due to physical problems, pain and general health perception) and four mental aspects (limitations due to emotional problems, social functioning, vitality and mental health) were measured. Improvements in all aspects (physical and mental) were observed, with the exception of pain. Therefore, exercise improves quality of life in postmenopausal women, which agrees in concept with the present study.

According to the recommendation for adults from the American College of Sports Medicine and the American Heart Association, in order to promote health and stay healthy, adults should engage in aerobic physical activity of moderate intensity for a minimum period of 30 minutes, five days a week or of vigorous intensity for at least 20 minutes, three days a week.² In the present study, the active group met the recommendation and was classified as active by the IPAQ.³⁸ Combinations of activities of moderate to vigorous intensity can be performed to meet this recommendation.²

No significant differences were found in any of the mood states assessed. However, positive effects of physical activity are widely described in the literature.^{49,51-59} Some research is done with non-athlete samples^{60,61}, especially populations with some form of disability or disease; however, most of the publications refer specifically to athletes.^{35, 62,63,64}

Similarly to our study, Bittar *et al.* (2013) compared the effect of adapted sporting activities

for six months in psychobiological aspects of elderly women using the Brunel Mood Scale. The Active group showed lower scores of anxiety and depression, better quality of life with increased functional capacity and vitality, and improved body image, when compared to the Control group.

Although significant differences were not observed in mood states, the majority of the scores were favorable in the active group, which suggests the beneficial effect of physical activity on mood states.

Conclusions

Research limitations such as sample loss and variables' control need to be pointed out. Considering our longitudinal research with a 6-month period of data collecting, only 28% of the volunteers completed the study. External factors that could possibly affect our results such as diet, lifestyle, social interaction and personal problems were not assessed. These limitations might explain why most of our results did not agree with the literature.

Our sample was comprised of healthy adults with a mean age of 25 years, a time in life when health has not yet been significantly affected by sedentarism. Thus, the perceived impact of physical activity on health, and consequently on quality of life, may be smaller. For young adults, a healthy lifestyle could, therefore, be dissociated from physical activity. The same is unlikely to be valid for older people, whose health is significantly influenced by their lifestyle and inherent degenerative factors associated with aging. Therefore, regular physical activity has a much greater potential to impact the quality of life of this population. This may be one reason some domains were unaffected by physical activity.

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