



## STRESS SCORING WITH PHYSICAL BEHAVIOR AND ITS SOCIAL VARIABLES

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### ABSTRACT

Regular practice of physical exercises promote several beneficial effects to the human being, however, the action of that one as a therapeutic resource to stress has been much discussed. Thus, the present study has aimed to evaluate the association of socioeconomic levels and being physically active with stress. This is an exploratory research with a quantitative approach, carried out in a country town, in a sample composed by 779 respondents. Two questionnaires have been applied, being: a) Inventory of Stress Symptoms for Adults of Lipp (ISSL - adapted); b) International Physical Activity Questionnaire (IPAQ - short version). Statistical analysis has been obtained using the Chi-square test and the Fisher's exact test. It was identified that of the 779 research subjects, 715 presented an indication of stress, corresponding to 91.8% of the interviewed and of the 357 considered physically active, 91.9% manifested the emotional alteration in question. Considering the above, the present study has demonstrated that physical activity does not influence the reduction of stress levels, emphasizing the need to verify the category of activity performed, since short-term walking or occasional bicycle rides are not considered, necessarily, physical exercises. However, the possibility of these individuals being classified as 'physically active' is not ruled out.

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## INTRODUCTION

Over time it has become increasingly common for a human being have to deal with situations in which his brain understands as a threat or challenge. Episodes such as those characterize the stress state, which would be a physiological adaptation that requires a response at stressor time (Luczynski et al., 2015). That mechanism involves the most diverse systems of the body, among them is endocrine system, which through the action of suprarenal gland releases hormones known as "stress mediators" (Sanches et al., 2016).

The process described is fragmented into three stages and the whole of these has been titled SAG (General Adaptation Syndrome) since 1946 by Selye, an endocrinologist who identified stress as a medical problem (Sousa and Silva, 2015). The first phase is responsible for generating a response to stressor agent through dynamics performed by catecholaminergics, adrenaline and noradrenaline, known as adaptation; then the resistance phase, with cortisol as the elemental mediator and aiming to reestablish the balance of the internal environment (Szabo et al., 2012). If this feature fails, the last so-called stage of exhaustion is established, in which systems go into a state of exhaustion and human structure continues to react chronically (Jackson, 2014).

Among the most common symptoms are constant headache, muscle contractures and difficulties to relax, factors that severely compromise the individual's quality of life (Mascella *et al.*, 2014). Other references have shown that, due to absence of homeostasis, each organ starts to function at different intensities, implying accelerated heart rate, increased blood pressure, gastrointestinal dysfunctions and insomnia (Teixeira *et al.*, 2016). Chronicity and persistence of stress state may lead to other pathologies such as depression, anxiety or even greater risk of developing a metabolic syndrome, characterized as a set of diseases involving obesity, changes in cholesterol, triglycerides and glycemia (Ludwig *et al.*, 2012). Heart failure and ischemia can also be a consequence of elevation of stress levels, thus showing the importance of studying and understanding possible aggravations resulting from described situation (Silva *et al.*, 2015). A healthy lifestyle, including good nutrition and physical exercise are the most commonly cited forms of prophylaxis and treatment (Passaglia *et al.*, 2013). When a person undergoes physical activity, their levels of endorphin, a neurotransmitter that provides a sense of well-being and a high analgesic power, increase (Hildebrandt *et al.*, 2014).

Aerobic exercise has the capacity to lower blood pressure and it is considered a beneficial effect, considering that hypertension crises can be caused by an untreated stress situation (Casonatto *et al.*, 2016). Observations by Sanches *et al.* (2016) indicate that physical activity plays a crucial role in improving emotional state and reversing chronic stress, however it still makes clear that there is no scientific consensus on the subject. Work or surplus study, rules to be followed and unfavorable socioeconomic aspects are issues inherent to adult life and, for those reasons, it can be affirmed that the age group determined is the most affected by consequences brought about by stress (Rodriguez and Carlotto, 2017). Those conditions have contributed to the development of a phenomenon known as burnout syndrome or professional exhaustion, characterized by a tension, accompanied by chronic stress, motivated by exhaustive labor conditions, which have affected both the psychological and physical aspects of the individual (Bakusic *et al.*, 2017). Some analyzes have shown mental disorders are the most common causes of absences at work, a scenario known as absenteeism that, if persistent, is a risk factor for depression (Silva-Junior and Fischer, 2015). Knowing negative repercussions of described dysfunction and its relation to physical behavior, it was verified the need to analyze whether physical activity acts as a therapeutic resource, since there is a distorted view between physical 'activity' and 'exercise'. From this perspective, this study has aimed to evaluate the association of socioeconomic levels and being physically active with stress.

## METHODOLOGY

This is a quantitative research, observational and cross-sectional, in a country town in Bahia (latitude: 14° 51' 58" S; longitude: 40° 50' 22" W). The same is a fraction of a project titled "Epidemiological profile of obesity in the city of Vitória da Conquista / BA". Data were collected in 2016 using the stratified random approach method. The sample has been consisted of 779 adult individuals, taking into account the constancy of hormonal levels in people between ages of 19 and 46 years old. The analysis has been performed considering a level of significance of  $p < 0.05$ , with the aid of SPSS® 23.0 statistical program, using the Chi-square test and the Fisher's exact test.

The results have been obtained through application of two questionnaires: a) Inventory of Stress Symptoms for Adults of Lipp (ISSL - adapted), which aims to identify the symptoms of the emotional alteration in question and the phase in which the individual is presented; b) International Questionnaire of Physical Activity (IPAQ - short version), consisting of 8 questions that allow to measure the period spent in exercises during the week. It is important to note the results have been interpreted and divided into "stressed" or "non-stressed" and "active" or "non-active" individuals, respectively. Participants of research have been clarified on the methods to be used for collection according to Resolution 466/12 (National Health Council), which constitutes international documents of research involving human beings. It is noted that the project has been approved by Research Ethics Committee of the college Faculdade Independente do Nordeste (Opinion No. 1,859,545).

## RESULTS

The proportion of individuals which have been part of the sample was similar to that found in local population, being composed of a greater number of women, representing 52.0%. Considering those 779 participants, 715 have presented a stress indication, corresponding to 91.8%. Among them it has been possible to observe that 92.1% of female adults are stressed and 91.4% of male showed the same emotional alteration. From the 763 respondents who answered the question of 'social class' (Table 1), 536 belonged to class E and indicated symptoms of stress, totaling 70.3%.

**Table 1. Presentation of research data on association of stress and the main analyzed variables**

		Stress		Total
		No	Yes	
Social Class * $p \leq 0,024$ ♂	Class A	0	0	
	Class B	0	3	
	Class C	11	58	
	Class D	7	105	
	Class E	43	536	
	Total	61	702	763
IPAQ * $p = NS$	Active	29	328	
	Not Active	35	387	
	Total	64	715	779
Employment Situation * $p \leq 0,015$ (total) * $p \leq 0,005$ ♂	Employed	55	534	
	Unemployed	7	179	
	Total	62	713	775
Schooling * $p = NS$	Graduated	23	197	
	Not Graduated	39	508	
	Total	62	705	767
Food Consumption * $p \leq 0,001$ (total) * $p \leq 0,003$ ♂	Little	3	75	
	Normal	54	437	
	Much	7	197	
	Total	64	709	773
Assessed Energy Consumption * $p = 0,000$ (total) * $p \leq 0,022$ ♂ * $p = 0,000$ ♀	Little	0	60	
	Suitable	8	267	
	Much	56	386	
	Total	64	713	777

It has also found that 92.0% of women who were physically active were stressed, a confirmed condition among male public, which 91.7% of physically active showed evidence of psychological variation in question. Analyzing the results in their totality, it has been observed that of 357 individuals considered physically active, 91.9% presented symptoms of stress. It has emphasized that to obtain the result it was taken into account (Table 2),

**Table 2. Characterization of individuals who have composed the sample**

		Male	Female	Total
Gender		374	405	779
	Total	374	405	779
Social Class	Class A	0	0	
	Class B	0	3	
	Class C	46	23	
	Class D	64	48	
	Class E	258	321	
	Total	368	395	763
IPAQ	Active	144	213	
	Not Active	230	192	
	Total	374	405	779
Stress	Stressed	342	373	
	Not Stressed	32	32	
	Total	374	405	779
Employment SITUATION	Employed	298	291	
	Unemployed	72	114	
	Total	370	405	775
Schooling	Graduated	102	118	
	Not Graduated	266	281	
	Total	368	399	767
food Consumption	Little	34	44	
	Normal	222	269	
	Much	116	88	
	Total	372	401	773
Assessed Energy Consumption	Little	28	32	
	Suitable	124	151	
	Much	222	220	
	Total	374	403	777

- social class, of which more than 75% belong to class E, that is, they have lower purchasing power;
- schooling, showing that less than 30% have completed higher education;
- employment status, indicating that more than 75% of the sample work;
- food consumption, indicating that more than 95% of individuals who say they eat overdone are stressed;
- energy to enjoy the day, evidencing that all those who reported 'little energy' showed symptoms of stress.

## DISCUSSION

In view of results obtained, it has noticed there was no association among variants, opposing the findings in some studies. This may have occurred because of the type of exercise practiced by individuals, since only moderate-time aerobic ones are able to reduce the levels of stress and other psychic disorders (Souza de Sá Filho *et al.*, 2015). In view of the above, one of the possible conclusions of analysis is that active participants are physically more adept at RE (resistance exercises). It should be noted that the opposition found among the results may also be occurring due to failures in analyzes related to the International Questionnaire of Physical Activity. IPAQ is often interpreted as an indicator of physical exercise, when in fact it has aimed to classify individuals into physically active or not, thus, "being active" goes from a walk to work to scheduled exercises like ERs (Van Dyck *et al.*, 2015). The bodybuilding or intense ER is usually associated with increased blood pressure and oxidative stress (Silva *et al.*, 2015). That, in turn, is a process that damages cell or tissue due to an increase in production of oxidizing compounds, oxygen (O<sub>2</sub>) and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), and reduction in performance of defense system (Krüger *et al.*, 2015). It is necessary to emphasize that intense physical exercise allows a greater formation of free radicals which, if not neutralized,

generate the mentioned lesion process (Pingitore *et al.*, 2015). Based on evaluation principles of IPAQ, social class of the largest portion of sample and geography of the city under analysis, it is believed that some of research subjects move to their work on foot or by bicycle, seeking in the majority of times to save money, and not necessarily, improvements in quality of life with consequent decrease of stress. A very common and found aspect among those who have composed the sample is high food consumption, emphasizing hyper-caloric, the so-called "comfort foods", which in an attempt to restore feelings of irritability, nervousness, worry and impatience, ingest in an excessive way sources of sugar and fat (Ulrich-Lai *et al.*, 2015). That factor, together with a low exercise performance, favors the excessive accumulation of adipose tissue in body, which can lead to obesity (Oliveira *et al.*, 2015).

In addition to those aggravating factors, it has been observed that stressed individuals have less energy and a disposition to enjoy the day, thus reducing practice of leisure activities, compromising quality of life. Those attributes have as main reason work wear and, for that reason, entertainment situations during working-hour breaks have been pointed out as the best recovery measure, avoiding thus, peaks of tension (Hadžibajramović *et al.*, 2015). As for socioeconomic factors, it has been possible to identify an expressive portion of low acquisitive power's individuals and who presented stress symptoms, since unfavorable financial conditions are pointed out as a chronic stressor that aggravates mental health (Ruiz-Pérez *et al.*, 2017). It has emphasized, many times, it isn't income maintenance that becomes a concern, but rather the insecurity in lack of provision, caused by economic instability (Hjelm *et al.*, 2017).

## Conclusion

In view of the above, this current study has demonstrated that physical activity does not influence in reduction of stress levels. Although several authors have confirmed those psychosocial benefits, it is important to verify the category of that activity, since short-term walking or occasional bike rides are not necessarily considered physical exercises. However, the possibility of those individuals being classified as 'physically active' is not ruled out. For future studies, an evaluation of cortisol levels is suggested in order to measure their dosage in bloodstream, since it is the main chemical mediator related to behavioral regulation, known as "stress hormone". Another suggestion would be to identify the kind of exercise practiced, trying to understand if some of them, specifically, is associated with the reduction of that described disorder.

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