BASIC PSYCHOLOGICAL NEEDS, HAPPINESS AND PHYSICAL ACTIVITY: A STUDY WITH PUBLIC SERVANTS IN A STATE OF THE BRAZILIAN AMAZON

NECESSIDADES PSICOLÓGICAS BÁSICAS, FELICIDADE E ATIVIDADE FÍSICA: UM ESTUDO COM SERVIDORES PÚBLICOS DE UM ESTADO DA AMAZÔNIA BRASILEIRA

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https://doi.org/10.56238/sevened2025.021-083

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ABSTRACT
Autonomy, competence and belonging are basic psychological needs (NPB), which can determine a good life when met. For adults of working age, workers responsible for attending services provided by the state, the satisfaction of NPBs in the context of life can determine the quantity and especially the quality of care needed by society. Due to the importance of this theme, the aim of this study was to associate the levels of BPN satisfaction in the general context of life with the indicators of happiness and the level of physical activity (PA). The study involved 108 individuals with a mean age of 31.86 years (SD ± 8.9). The instruments used to assess the happiness indicators were the psychological well-being scale (PWB), the life satisfaction scale (SWLS), the positive and negative affect scale (PANAS) and the PA level through the IPAC. The results indicate that people with high levels of NPB satisfaction have higher levels of happiness and physical activity.

Keywords: Physical activity. Happiness. Autonomy. Competence and relationship.

RESUMO
Autonomia, competência e pertencimento são necessidades psicológicas básicas (NPB), que podem determinar uma vida boa quando atendidas. Para adultos em idade produtiva, trabalhadores responsáveis por atender serviços prestados pelo Estado, a satisfação com as NPBs no contexto da vida pode determinar a quantidade e, principalmente, a qualidade dos cuidados necessários à sociedade. Devido à importância deste tema, o objetivo deste estudo foi associar os níveis de satisfação com as NPBs no contexto geral da vida com os indicadores de felicidade e o nível de atividade física (AF). O estudo envolveu 108 indivíduos com média de idade de 31,86 anos (DP ± 8,9). Os instrumentos utilizados para avaliar os indicadores de felicidade foram a escala de bem-estar psicológico (BEP), a escala de satisfação com a vida (SWLS), a escala de afeto positivo e negativo (PANAS) e o nível de AF por meio do IPAC. Os resultados indicam que pessoas com altos níveis de satisfação com as NPBs apresentam maiores níveis de felicidade e atividade física.

Palavras-chave: Atividade física. Felicidade. Autonomia. Competência e relacionamento.

RESUMEN
La autonomía, la competencia y la pertenencia son necesidades psicológicas básicas (NPB), cuya satisfacción puede determinar una buena vida. Para los adultos en edad laboral, trabajadores responsables de acceder a los servicios públicos, la satisfacción de las NPB en el contexto de la vida puede determinar la cantidad y, especialmente, la calidad de la atención que necesita la sociedad. Dada la importancia de este tema, el objetivo de este estudio fue asociar los niveles de satisfacción con las NPB en el contexto general de la vida con los indicadores de felicidad y el nivel de actividad física (AF). El estudio incluyó a 108 personas con una edad media de 31,86 años (DE ± 8,9). Los instrumentos utilizados para evaluar los indicadores de felicidad fueron la Escala de Bienestar Psicológico (EBP), la Escala de Satisfacción Vital (ESV), la Escala de Afecto Positivo y Negativo (PANAS) y el nivel de AF a través del IPAC. Los resultados indican que las personas con altos niveles de satisfacción con las NPB presentan mayores niveles de felicidad y actividad física.

Palabras clave: Actividad física. Felicidad. Autonomía. Competencia y relaciones.

INTRODUCTION

Throughout life, people may experience situations that cause different sensations, these experiences can be from a small physical discomfort, a bicycle fall while trying to learn, to an intense sense of contentment, birth of a child or successfully complete a planned goal. As a consequence, these sensations can arouse both positive emotions (joy, pleasure), and negative emotions (fear, sadness). For the philosopher Epicurus, it doesn't matter what happens to the person, but how he reacts would be the most important, that is, the individual interpretation of emotions will moderate their effects on behavior.

Research in positive psychology (Seligman & Csikszentmihalyi, 2014) has observed that healthy life behaviors are generally related to positive interpretations of life, that is, the "good life" seems to be the result of a positive attitude towards events. Contrary to what may seem, to have a positive view of life is not to always be cheerful, regardless of situations, to have a pessimistic attitude from the point of view of reason, but optimistic of the will, to work (Gramsci, 2006).

However, being happy with a defeat or behaving cheerfully regardless of personal or social suffering is toxic positive behavior (Quintero & Long, 2019; Sokal, Trudel & Babb, 2020). This overgeneralization of optimism and happiness in all situations, which deny the impending issues and instill unpleasant emotions of the moment can promote an unrealistic pattern of the situation, with a fixed mentality that makes it difficult to accept other possibilities to seek possible solutions (Ford & Mauss, 2014).

On the other hand, the healthy positive being, when experiencing adverse situations, which arouse negative emotions, avoids the loss of control of their actions, but does not deny the existence of emotions. Then it seeks solutions to overcome difficulties, using its cognitive resources, reinterpreting internal and external conflicts, making decisions in a balanced way, to overcome difficulties and improve its level of development, fullness and well-being (Ryan & Deci, 2001, David, Boniwell & Ayers, 2014).

It is important to note that these cognitive processes obey a very similar brain circuit between people, but the interferences of the external context have important influences. That's because the brain has an analytical and an emotional side, and the latter is decisive in decision-making. That is, it occurs by a dialectical interaction between the active organism and the social context (Ryan & Deci, 2017).

Studies seeking neural correlates of emotions have shown prefrontal cortical activation in decision-making, with greater activation of the right hemisphere (emotional side), when it involves negative emotions and greater activation of the left in positive emotions (analytical side). Thus, apparently decision-making seems to objectively seek

what causes intrinsically pleasant sensations, in the sense of searching for what is good, which leads to pleasure (Sato et al., 2015; Di Domenico & Ryan, 2018).

Although, clearly, the brain processes to act are physiologically observable, they also reinforce the function of the social context and to be free to immediate external interests by natural inclination to play, explore and manipulate things. In doing so, being expands its skills and capabilities. This characteristic, therefore, affects the cognitive and emotional development of the person, producing a spontaneous and active engagement to tasks (Ryan & Deci, 2017). Moreover, because it influences not only what it does, but also how it feels, the results are positive feelings of the person interested in what they are doing and demonstrating curiosity, exploring new stimuli and working to face new challenges (White, 2008).

The decision to do physical activities (PA), for example, depends on how the person evaluates their involvement with the context of the event, that is, they may not initially consider it fun to participate in the activity, but for external reasons (improving the appearance, by medical indication or necessary to perform their work) they participate. But on the other hand, if the context manages during the process to satisfy the BPN, the person will probably be happy to participate in the activity.

Therefore, well-being would be the product of BPN satisfaction (Tay & Diener, 2011; Deci & Ryan, 2000). Well-being is a multidimensional and dynamic construct, but current research has been based on two traditional concepts: the hedonic approach (Epicurus, Letter on Happiness) that focuses on the pursuit of pleasure and attenuation of suffering and the Eudaimenic approach (Aristotle, Ethics to Nicomachus), which focuses on achieving the fullness of human virtues (Deci & Ryan, 2008; Delle fave et al., 2011; Ryan & Deci, 2001). These two approaches have been widely explored in various international scenarios, incorporating well-being to happiness (Diener, 2000; Cummins, 2012; Veenhoven, 2019). In positive psychology, happiness has been treated as a concept that encompasses subjective well-being (SWB), psychological well-being (PWB), hedonism, eudaimonia and flourishing (Henderson & Knight, 2012; David, Boniwell & Ayers, 2014).

Thus, the person who has a feeling of fullness of life, vitality to face difficult moments of life is faithful to its virtues, regardless of the problem faced, seems to have significant implications for health. Research has shown, greater physical and mental health balance, longer active life and longer total life, related to both hedonic well-being and eudaionic well-being. (Lyubomirsky, Sheldon & Schkade, 2005; Diener et al., 2017)

These people generally report that they have behaviors relevant to the purpose in life, with healthy habits, including more sleep, low consumption of alcohol and drugs, good

eating habits and PA practice, which are behaviors that favor the good work of the organic metabolism and cardiovascular, immunological and endocrine (Boehm et al., 2016; Sin, 2016).

However, the factors that make up well-being and happiness that facilitate the practice of PA are not yet well established. Partly due to the multiple definitions of the term well-being, usually used in the individual biophysical context and not in the psychosocial context (Kabanova et al., 2021). It also partly because studies involving BPN satisfaction and PA level, observed the satisfaction of BPN in the context of exercise and correlating satisfaction to happiness indicators (Souto Barreto, 2014; Moltó & Bruna, 2017; Sun & Lin, 2021).

Understanding the ideal conditions of satisfaction of the NPB of people of working age who provide services to society can have an impact on collective well-being, hence the choice of public servants. Since, few studies analyze the satisfaction of NPB in the general context of life and its impact on PA levels and/or with indicators of happiness, like this study. Thus, this study seeks to know if there is a relationship between the satisfaction of the BPN, the happiness indicators and the levels of PA of public servants in a Brazilian state.

METHODOLOGY

TYPE OF STUDY

This is a non-experimental, ex-descriptive ex-fact study with a single measurement in a group (reliability intervals of 95%).

PARTICIPANTS

Adult civil servants (n=108; 48.15% women) aged between 25 and 56 years (Me 38.19; SD 6.86) with a mean BMI of 27 kg/m2 (SD 4.35). Table 1 shows the descriptive data of the research participants, in which it is observed that most participants (61%) have monthly incomes between 4 and 8 minimum wages.

INSTRUMENTS

The satisfaction of basic psychological needs (BPN) in the general context of life was evaluated by the scale validated by (Sousa et al., 2012), which is composed of three subscales that correspond to the needs of competence, autonomy and relationship.

As indicators of happiness, three scales were used: the psychological well-being scale (Ryff, 1989) adapted for Brazil by (Machado, Bandeira & Pawlowski, (2013), the Satisfaction with Life Scale (SWLS) proposed by Diener et al., (1984) and adapted for Brazil (Gouveia et al., 2009). And yet the positive and negative affect schedule (PANAS) proposed by Watson, Clark & Tellegen (1988), adapted by Portuguese by Galinha, Pereira & Esteves (2014), the last two scales were used to assess subjective well-being (SWB).

Table 1- *Descriptive Survey Data*

		N (108)	**%**
Gender	Male	56	51.85%
	Female	52	48.15%
Income average monthly	Between 2 and 4 minimum wages	19	17.59%
	Between 4 and 6 minimum wages	42	38.89%
	Between 6 and 8 minimum wages	24	22.22%
	More than 8 minimum wages	23	21.30%
Weekly PA	Low	36	33.33%
	Moderate	37	34.26%
	High	35	32.41%
		Mean	**Standard deviation**
	Age (years)	38.19	6.87
	Weight (Kg)	78.71	15.48
	Height (m)	167.89	8.23
	BMI	27.78	4.35
	Total weekly PA time.	420.93	333.44

Source: Research data

To determine the level of PA, the IPAQ, short version (Matsudo et al., 2001), was used, with reference to the last week. To classify the PA levels of each individual based on IPAQ recommendations, in the following categories of PA: Category 1(Low), individuals classified in IPAQ as insufficiently active. Category 2 (Moderate), assets. Category 3 (High), the very active.

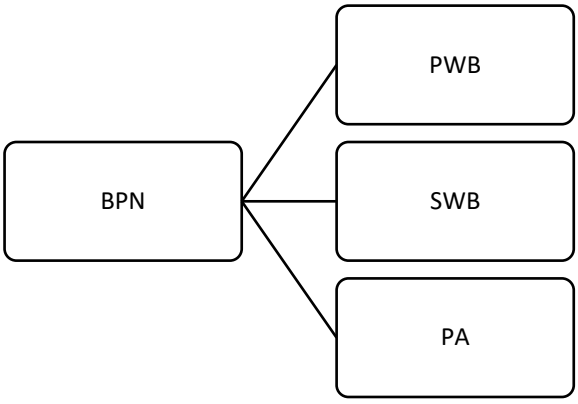
PROCEDURE

After obtaining ethical approval for the study, the participants, public servants of the State of Amapá, Brazilian Amazon, were randomly selected, using a multifocal strategy that included ads on social network sand e-mail. Participants were asked to link to the online questionnaire (google forms), and were asked to send them to co-workers. The inclusion criteria were to be an effective civil servant and to be in agreement with the free and informed consent term (TCLE). The servers that at the time of the research were out of service for some reason or difficulties in accessing the research medium were included. The participants were grouped according to the level of PA (low, moderate and high) considering the weekly volume of PA practice.

ANALYSIS ANDSTATISTICS

Statistical analysis was performed with IBM Software SPSS 25.0, examining means, SD 95% CI (95% CI), medians and interquartile interval (IQR) were calculated to describe categorical variables, reliability of scales (Cronbach's alpha), normality analysis of dependent variables (Kolmogorov-Smirnova), correlations (Spearman) and mean scans (Kruskal Wallis) and Multiple Regression Analysis. Figure 1 shows the hypothetical causal model of the study.

Figure 1- *Conceptual Framework*



RESULTS

Table **2** shows the descriptive statistics (position and dispersion) of BPN, PWB, SWB and PA of the study participants. The scales were evaluated by Cronbach's Alpha, and reliability was acceptable for PWB (α = .77), SWLS (.88) and PANAS (.78). But results don't fit the normal curve. And still in the BPN scale, autonomy reached the highest median (7.40) and competence presented lower dispersion (0.95). In SWB, autonomy and personal growth had the highest median. In the SWLS, positive affects had the highest median than positive affects.

Table 2- Mean, SD, CI, Median, IQR, Cronbach's Alpha Alpha of Study Variables

Study variables	Me (dp)	95% CI	Median (IQR)	Alpha
BPN- Autonomy	7.26 (1.33)	7.01–7.51	7.40 (1.55)	.681
BPN-Competence	4.86 (.68)	4.73–4.99	4,83 (0.95)	.558
BPN- Relationship	5.06 (.70)	4.92–5.19	5,12 (1.12)	.673
Positive Affects	4.09 (.78)	3.94– 4.24	4,20 (1.15)	.877
Negative Affects	2.02 (1.00)	1.83–2.21	1.80 (1.40)	.642
Life Satisfaction	3.72 (0.73)	3.58 –3.86	3,80 (1.00)	.842
PWB Autonomy	4.50 (0.85)	4.33–4.66	4,50 (1.12)	.288
PWB Relationship with others	4.49 (0.98)	4.29–4.67	4,50 (1.29)	.429
PWB Environment Domain	4.13 (0.62)	4.01–4.24	4.16 (0.83)	.059
BRP Self-acceptance	4.58 (0.53)	4.47–4.67	4.66 (0.91)	.959
PWB Personal growth	5.40 (0.68)	5.26–5.52	5,50 (1.0)	.756
PWB Purpose of life	5.04 (0.77)	4.89–5.18	5.0 (1.0)	.759

Note: p < significance level. Source: Research data

In Table 3**,** are the correlations of BPN, SWB, PWB and PA. The BPN were significantly associated with all dimensions of SWB, PWB and PA. But it is noteworthy that negative affects (SB) are negatively related to all factors observed in the study.

Table 3 - *Variable Correlation Analysis*

	1	2	3	4	5	6	7	8	9	10	11	12	13
Autonomy	1												
Competence	.474**	1											
Relationship	.300**	.266**	1										
Positive	.481**	.304**	.357**	1									
Negative	.465**	-.208*	-.263**	-.345**	1								
Life Satisfaction	.231*	.200*	.191*	.436**	-.196th*	1							
Autonomy	.459**	.290**	.169	.371**	-.414**	.254**	1						
Relationship with others	.473**	.243*	.547**	.549**	-.475**	.338**	.429**	1					
Environment domain	.513**	.294**	.269**	.616**	-.392**	.493**	.494**	.466**	1				
Self-acceptance	.481**	.359**	.311**	.600**	-.451**	.581**	.502**	.523**	.649**	1			
Personal growth	.371**	.291**	.188	.584**	-.232*	.383**	.298**	.344*	.540**	.566**	1		
Purpose of life	.525**	.435**	.258**	.627**	-.319**	.439**	.426**	.468*	.637**	.709**	.753**	1	
Phantom Assassin Weather	.305**	.195th*	.220*	.364**	-.206*	.12th	.294**	.359**	.354**	.253**	.219*	.349**	1

Note: **. The correlation is significant at level 0.01; *. correlation is significant at level 0.05. Source: Research data

Table 4 shows the group comparisons. And the results show that the group of High level of PA obtained the values of position measurements, ahead of the groups of moderate and low level of PA. And also in the comparison test between the groups, significant differences were found (p<.05). And the post-hoc test showed that they occurred between the low and high groups of THE level: in relation to others, positive affects and purpose of life. And also between the moderate and high groups of the level of PA in the domain on the environment.

Table 4- *Mean, Standard Deviations, BPN, PWB, SWB and PA*

*element.*Characteristic	Low (N36)		Moderate (N37)		High (N 35)		Kruskal Wallis
	Mean (SD)	Median (IRQ)	Mean (SD)	Median (IRQ)	Mean (SD)	Median (IRQ)	Test value
BPN							
Autonomy	6,83 (1.56)	7.00 (1.40)	7.26 (1.16)	7.40 (1.70)	7.60 (1.27)	7.50 (1.15)	5.48
Competence	4.72 (.72)	4.67 (.83)	4.84 (0.64)	4.83 (0.92)	4.99 (0.70)	5.0 (1.25)	2.51
Relationship	4.9 (.66)	4.75 (1.00)	4.98 (0.71)	5.0 (1.13)	5.27 (0.68)	5.38 (0.88)	4.75
PCB							
Autonomy	4.28 (.78)	4.33 (1.0)	4.42 (.89)	4.50 (1.08)	4.76 (0.82)	4.83 (1.29)	5.10
Relationship with others	4.13 (.85)	4.17 (1.0)	4.41 (1.05)	4.17 (1.50)	4.85 (0.89)	4.83 (1.29)	10.14*
Domain over the environment	4.03 (.65)	4.17 (1.0)	3.78 (0.58)	3.83 (0.83)	4.39 (0.57)	4.50 (0.96)	10.89*
Self-acceptance	4.38 (.58)	4.50 (0.83)	4.60 (0.50)	4.67 (0.75)	4.69 (0.49)	4.67 (0.79)	5.39
Personal growth	5.25 (.96)	5.50 (0.83)	5.39 (0.57)	5.50 (0.92)	5.52 (0.53)	5.67 (0.83)	5.50
Purpose of life	4.78 (.86)	5.0 (0.63)	4.99 (0.68)	5.0 (1.08)	5.31 (0.73)	5.58 (1.33)	6.87*
SWB							
Positive affects	3.70 (1.02)	1.04 (1.40)	4.08 (0.61)	4.0 (.90)	4.40 (0.42)	4.40 (1.00)	11.59*
Negative Affects	2.28 (1.17)	1.17 (1.60)	2.04 (1.0)	1.6 (1.0)	1.79 (0.82)	1.70 (1.0)	.838
Life Satisfaction	3.75 (.70)	3.60 (1.2)	3.64 (.73)	3.6 (1.10)	3.81 (0.76)	3.90 (1.15)	.658

Note. *p < significant effect on the PA level. Source: Research data

The results of multiple regression (Table 5) indicate how the BPN of autonomy, competence and relationship predict the weekly time of PA. According to the findings, the satisfaction of the BPN positively and significantly predicts the weekly pa time of the participants (R=0.335 R2=0.112, F= 0.174, p<.05). As for the relationships between predictor variables (autonomy, competence, relationship) and PA time, it is verified that the need for competence predicts in a more significant and positive way PA (β = 0.24; p< .05). After the need for autonomy, the need for relationship (β = .13; p< .05) and the need for competence (β = .04; p<.05) predict the weekly time of PA in a significant and positive way, respectively. According to the results of the analysis, all predictor variables represent 42% of the total variance of the weekly PA time.

Table 5- Multiple Regression Analysis to Predict Physical Activity Time

	B	Beta	T	p
Need for Autonomy	61.16	.243	2.267	. 025
Need for Relationship	64.42	.135	1.376	. 17th
Need for Competence	21.54	.044	0.417	. 678

R=0.335, R2=0.112, F=0.174, p<.05. Source: Research data

DISCUSSION

Since the theory of self-determination proposes the satisfaction of BPN as the "guiding thread" of human development, vitality, well-being and happiness, which provides proactive engagement, information assimilation and behavior regulation (Deci & Ryan, 1985; Ryan & Deci, 2017).

Thus, in this study, we found that BPN are positively correlated with positive affects and negatively related to negative affects. What each person makes his assessment based on his knowledge the subjective experiences in the environment to which he is inserted (Diener et al., 1999). But the predominance of positive affects over negative ones is characteristic of a good life (Satici, Uysal & Deniz, 2016).

We also observed that life satisfaction is positively related to BPN. The balance between positive affect and negative affects along with satisfaction with life, opposes the SWB. What for some authors are the components of happiness (Diener, 1984, Diener et al.; 1999; Ryan & Deci, 2001).

In relation to PWB, an active process of development and positive functioning, composed of six dimensions (self-acceptance, personal growth, life purpose, relationships with others, mastery of the environment and autonomy), which are cognitive and affective in nature, making it possible to recognize the capacities and weaknesses of psychological functioning (Ryff, Keyes & Hughes, 2003; Martela & Sheldon, 2019).

In this study, the PWB was positively correlated with THE with the strongest association observed in the need for autonomy. Corroborating the findings of Slemp & Vella-Brodrick (2014), similar audience of workers. And yet the PWB dimensions are negatively related to negative affects, agreeing with Sheldon and Bettencourt (2002). Furthermore, the dimension relationship with the others, domain of the environment and purpose of life presented higher values of correlation with the BPN.

The perception of BPN satisfaction in the context of life can promote in the person more self-determined feelings, self-sufficiency and active behaviors, promoting higher levels of PA, in turn, will have repercussions not only positive on the dimensions of happiness, but

also on the mental health disposition (Atkinson, 1991, Ryan & Deci, 2000; Ryan & Deci, 2001). Thus, with these psychological resources available, the individual can enjoy with greater confidence the practice of PA (Mack et al., 2012)

The analyses made in this study dismounted that the groups with higher levels of PA obtained better values of the position and dispersion media. These differences were confirmed in statistical tests in the PWB dimensions of relation to others, positive affects, purpose of life and domain over the environment.

Our findings meet studies such as Orzanco-Garralda & collaborators (2018), which highlight when people improve the environment, for example with the presence of trees and sidewalks, encourage people to get around on foot and increase their PA practices. Hwang (2017) highlight that the relationship with others, especially friends and family are factors that are related as the higher levels of PA.

Our findings identified a low association of mild and moderate PA with happiness indicators. But with the high association of the highest levels of vigorous physical activity with the indicators of happiness agreeing with Costigan et al., (2019).

In our study, the need for autonomy proved to be very important, with a positive association with all study variables and a negative association with negative affects. But on the other hand, the higher values in the groups with higher PA level were not significantly different. It is noteworthy that the need for autonomy has been associated with greater intention and involvement in the behavior of the exercise (Ingledew & Markland, 2008; Sylvester et al., 2012; Cuevas, García-Calvo, González, 2018), and that the impediment of autonomy has contributed to the decrease of PWB and SWB. (Gunnell et al., 2014).

The Multiple Regression Analysis (MMR) found influence of the needs of autonomy, competence and relationship in the volume of physical activity, SWB ides that the autonomy and relationship needs were more relevant for the volume of physical activity. The satisfaction of BPN is important for development in all contexts of life. And autonomy has had great relevance throughout development, life domains and cultures. And still of central importance for well-being and happiness. (Ryan & Deci, 2006)

In this study, in which we observed workers of relevance to public administration and with a salary level above the average in Brazil, the importance of promoting the satisfaction of BPN, especially for managers, stands out. (Kundi et al., 2020). Since they favor participation in physical activity with a positive impact on happiness (Wiese, Kuykendall, Tay, 2018) and on health perception (Ross, Cloutier, Searle, 2019).

CONCLUSION

Our results reinforce the results of a previous study on the relationship between cognitive assessment, the support people receive in the environment and the indicators of happiness and PA. This study evaluated the satisfaction of BPN in the general context of life, positive affect levels, negative affects, satisfaction with life, dimension of autonomy, relationship with others, environmental domain, self-acceptance, purpose of life, personal growth and levels of physical activity, exploring associations between these variables BPN and PWB, SWB and PA.

Our main findings suggest that people with high levels of BPN satisfaction have higher levels of PA, PWB and SWB, and when the variation related to the PA category was analyzed, the results on the variables of PA, PWB and SWB were more evident, with significant differences between the groups. In addition, the predictive effect of each of the NPB on the PA levels was found in all the NPB, especially the autonomy.

These findings can help to understand the associations between the general context of life and affective, emotional and psychological balance, which may reflect on consequences of people's mental health.

Thus, in the case of future programs that seek to facilitate involvement in physical activity programs, they should take into account the satisfaction of the BPN.

The main limitations since the study were its descriptive cross-sectional character that analyzes a specific group of people and the choice of convenience of the sample. In the future it will be useful to have a sample stratified by age group and income, or even administer the questionnaires at various times of the year.

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