

Subjective well-being, religiosity and anxiety: a cross-sectional study applied to a sample of Brazilian medical students

Bem-estar subjetivo, religiosidade e ansiedade: um estudo transversal em uma amostra brasileira de estudantes de medicina

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Abstract

Objective: To assess associations between subjective well-being (SWB), religiosity, anxiety and other factors in a sample of Brazilian medical students from a public university in northeastern Brazil.

Methods: The present study followed a cross-sectional, observational, analytical approach. Data were collected by administering a self-applicable questionnaire composed of questions focused on sociodemographic data and based on the Satisfaction With Life Scale (SWL), Positive Affect and Negative Affect Scale (PANAS), Penn State Worry Questionnaire (PSWQ), and the Duke Religiosity Index (DUREL).

Results: The sample comprised 417 medical school students (73.54% of all the enrolled students). The medical students assessed presented a medium level of satisfaction with life, low mean positive emotion levels and high anxiety/uneasiness levels. Surprisingly, lower anxiety and intrinsic religiosity (IR) scores were associated with higher scores in the two SWB parameters (positive emotions and satisfaction with life). Furthermore, the factors leisure activities, good sleep quality, financial support, age, and gender were associated with the highest SWB scores (with emotional and cognitive components, or with only one of these two components).

Conclusions: Data in the current study corroborated the negative association between SWB and anxiety; however, in opposition to the literature, they also evidenced a negative association between SWB and IR. In addition, the present research signaled the need for creating preventive intervention programs to increase SWB through positive psychological techniques and/or to decrease anxiety by applying, for instance, cognitive-behavioral therapy paradigms and/or mindfulness techniques to medical students.

Keywords: Medical students, anxiety, medical psychology, happiness, spirituality.

Resumo

Objetivos: Avaliar associações entre bem-estar subjetivo (BES), religiosidade, ansiedade e outros fatores em uma amostra de estudantes brasileiros de medicina de uma universidade pública do nordeste do Brasil.

Métodos: O presente estudo seguiu uma abordagem transversal, observacional, analítica. Os dados foram coletados por meio da aplicação de um questionário autoaplicável incluindo questões focadas em dados sociodemográficos e baseado na Escala de Satisfação com a Vida (SWL), Escala de Afeto Positivo e Afeto Negativo (PANAS), Questionário de Preocupação da Pensilvânia (PSWQ) e Índice de Religiosidade de DUKE (DUREL).

Resultados: A amostra foi composta por 417 estudantes de medicina (73,54% de todos os alunos matriculados). Os estudantes avaliados apresentaram nível médio de satisfação com a vida, baixos níveis de emoções positivas e altos níveis de ansiedade/preocupação. Surpreendentemente, menor ansiedade e escores de religiosidade intrínseca (IR) foram associados com maiores pontuações nos dois parâmetros de BES (emoções positivas e satisfação com a vida). Além disso, os fatores atividades de lazer, boa qualidade do sono, apoio financeiro, idade e sexo foram associados aos maiores escores do BES (com componentes emocionais e cognitivos, ou apenas um deles).

Conclusão: Os dados do presente estudo corroboraram a associação negativa entre BES e ansiedade; no entanto, contrariamente à literatura, eles também evidenciaram uma associação negativa entre BES e IR. Além disso, a presente pesquisa sinalizou a necessidade de criar programas de intervenção preventiva para aumentar o BES por meio de técnicas psicológicas positivas e/ou diminuir a ansiedade aplicando, por exemplo, paradigmas de terapia cognitivo-comportamental e/ou técnicas de *mindfulness* a estudantes de medicina.

Descritores: Estudantes de medicina, ansiedade, psicologia médica, felicidade, espiritualidade.

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Introduction

The prevalence of anxiety and depression disorders, as well as of burnout syndrome, among medical students is globally high.¹⁻³ Variables associated with the students' personality,⁴ with challenges inherent to the process of becoming a physician⁴ and with recurrent stress caused by the university studies themselves^{3,4} are among the risk factors for these disorders. Overall, the mental health of medical school students is impaired throughout the time they spend in medical school, since these students tend to develop dangerous coping strategies, such as alcohol consumption, rather than looking for medical care for their psychological issues, even though they are living in the health-care environment.⁵ Mental illnesses and psychological stress are associated with doctor/patient interaction issues,^{6,7} as well as with poor academic performance.^{4,6}

Conversely, aspects such as satisfaction with life and positive emotions⁸ have been studied by different fields of research and are acknowledged as mental illness protectors.⁹ Well-being is divided into eudaimonic well-being (EWB) and subjective well-being (SWB) in the positive psychology field. EWB is linked to the personal realization of one's potential; it consists of parameters such as positive relationships with others and self-acceptance. SWB is associated with satisfaction experiences; it has a cognitive component (satisfaction with life) and an affective component (positive emotions).¹⁰ Moreover, SWB and happiness have been associated with successful outcomes in life.¹¹

Thus, understanding the mental health of medical students through SWB indicators^{1,7} is significant because this will enable the development of intervention strategies based on positive psychology, in addition to the implementation of primary and secondary psychiatric disorder prevention protocols for medical students. These indicators may improve the quality of the health care these future professionals will provide to the population as a whole.

Therefore, the aim of the present study was to assess SWB to measure satisfaction with life and positive emotions, as well as factors mainly associated with religiosity and anxiety, in a sample of medical school students from a public Brazilian university. The correlations between these variables were also assessed.

Methods

The present study followed a cross-sectional, observational, analytical approach. Data collection

was carried out by means of a self-applicable questionnaire focusing on sociodemographic data. Questions about sleep quality were based on the Pittsburgh Sleep Quality Index,¹² and about sexuality, on the male and female sexual function quotient.^{13,14} To measure life satisfaction (cognitive component of SWB), the Satisfaction With Life Scale (SWL) was used.^{15,16} To measure positive emotions (affective component of the SWB), the Positive Affect and Negative Affect Scale (PANAS) was used.¹⁷⁻¹⁹ To measure anxiety levels, the Penn State Worry Questionnaire (PSWQ) was used,²⁰ and to measure the dimensions of spirituality/religiosity, the Duke Religiosity Index (DUREL) was used.²¹

The inclusion criteria were: to be effectively enrolled in the Medical School of Universidade Federal de Pernambuco (UFPE) in the first semester of 2016, and to be attending one of the first four school years of the course. Students attending the fifth and sixth school years were not included in the experiment because they were involved with their internship period in different sectors of the university hospital, as well as in other hospitals in the city of Recife, state of Pernambuco, Brazil. Moreover, the routine in the last years of medical school is quite different from what is experienced in its first four years. Students who did not complete the entire questionnaire and/or did not sign the consent form were excluded from the experiment.

Students attending classes between May and June 2016 were informed about the research and were asked to answer a questionnaire, as well as to read and sign the informed consent form. Anonymity was assured.

The present study was approved by the research ethics committee of Centro de Ciências da Saúde of UFPE, and its execution was approved by the institution.

Initially, a descriptive analysis of the sociodemographic profile of the studied population and of the explanatory variables was conducted. The bivariate analysis was used to test the associations between explanatory variables, SWL and PANAS indices. Means were tested using the Student *t* test, and Pearson's correlation test was conducted when age was the explanatory variable. The SWL and PANAS indices showed normal distribution; normality was tested using the Kolmogorov-Smirnov test. Associations presenting a significance level lower than 5% ($p < 0.05$) were considered eligible to the multivariate model. The explanatory models of the SWL and PANAS indices were estimated using multiple linear regression; β regression coefficients were presented along with their respective confidence intervals. The STATA software version 12.0 was used in the analysis (<http://www.timberlake-analytics.com.br/software/stata/>).

Results

A total of 423 students out of 567 (74.6%) enrolled in the first four years of the medical school in the first semester of 2016 were contacted because they were in class when the questionnaires were distributed. Six (6) out of the 423 students did not complete the entire questionnaire, so they were excluded from the statistical analysis. Thus, the final sample comprised

417 medical school students (98.58% of the completed questionnaires and 73.54% of the enrolled students); results are shown in Table 1.

The mean SWL score of the medical school students assessed was 22.3 ± 6.75 . The median score was 23 and the interquartile range (25th and 75th percentile [P25; P75]) varied from 17 to 27. SWL showed a minimum score of 5 and a maximum score of 35. The mean score for positive affect in the PANAS was $32.1 \pm$

Table 1 - Answers to the questionnaire applied to medical students

Characteristics	Statistics	Characteristics	Statistics
Sociodemographic characteristics		Sociodemographic characteristics	
Sex (male)	208 (49.9)	Gets involved in social events	279 (66.3)
Age (years), mean \pm standard deviation (minimum-maximum)	22 \pm 3 (17-43)	Performs artistic activity	91 (21.6)
Marital status		Performs physical activities	223 (53.5)
Married	17 (4.0)	Less than three times a week	109 (48.9)
Single	404 (96.0)	Three or more times a week	97 (43.5)
Children (yes)	7 (1.7)	Daily	17 (7.6)
Needed to move to another city to attend medical school	139 (33.0)	Sleep quality	
Lives with		How do you classify your sleep in general terms?	
Parents	268 (64.4)	Very good	18 (4.3)
Siblings	45 (10.8)	Good	138 (33.1)
Other family member	37 (8.8)	Bad	210 (50.4)
Friends	27 (6.5)	Very bad	51 (12.2)
Alone	38 (9.1)	Difficulty staying awake while driving, eating or participating in a social activity	
Type of house he/she lives in		None in the last month	88 (21.1)
Apartment/house	396 (95.0)	Less than 1 time per week	101 (24.2)
Fraternity	8 (1.9)	1 or 2 times a week	143 (34.2)
Boarding school	11 (2.6)	3 or more times per week	85 (20.3)
Other	2 (0.5)	Sexual quotient	
Extracurricular activities		Males: Are you sufficiently interested in sex to the extent of initiating the sexual intercourse?	
Has extracurricular activities	307 (72.9)	Never	4 (2.0)
What activities?*		Rarely	9 (4.4)
Extra shifts	145 (47.2)	Sometimes	31 (15.1)
Once a week	110 (75.8)	Half of the time	18 (8.6)
Twice a week	32 (22.1)	Most of the time	80 (38.9)
Three or more times a week	3 (2.1)	Always	66 (31.7)
Extension course	211 (68.3)	Males: Does your seduction ability give you confidence to look for sexual activity?	
Once a week	176 (83.4)	Never	14 (6.8)
Twice a week	27 (12.8)	Rarely	32 (15.5)
Three or more times a week	8 (3.8)	Sometimes	49 (23.8)
Scientific research	124 (40.4)	Half of the time	24 (11.5)
Has had extracurricular activities in the past*	319 (75.8)	Most of the time	76 (36.5)
Extra shifts	122 (38.2)	Always	13 (6.3)
Scientific research	256 (80.3)	Females: Do you spontaneously think of sex?	
Undergraduate science program	142 (44.5)	Never	6 (2.9)
Has a formal job	25 (5.9)	Rarely	33 (15.9)
Gets financial support (parents and family members)	377 (89.6)	Sometimes	108 (51.7)
The financial support bothers	129 (34.2)	Half of time	18 (8.7)
Practices leisure activity	397 (95.2)	Most times	20 (9.7)
Daily-basis	54 (13.6)	Ever	24 (11.5)
Weekly-basis	275 (69.2)		
Monthly-basis	59 (14.8)		
At least once in the semester/year	9 (2.2)		

Data presented as n (%), unless otherwise specified.

* Non-excluding categories.

6.7, with a mean minimum score of 11 and a maximum score of 48. The median score was 32 (28; 37). The mean score for negative affect was 23.6 ± 7.4 , with a mean minimum score of 10 and a maximum score of 45. The median score was 23 (17; 28). The PANAS scores ranged from 10 to 50.

The mean PSWQ score was 41.3 ± 9.0 . The minimum score for this scale was 23, and the maximum score was 66. The median score was 40, and the interquartile range varied from 35 to 47. The mean organizational religiosity index (OR) in the DUREL was 4 ± 1.6 ; the median score was 4 and the interquartile range varied from 2 to 6. In the non-organizational religiosity index (NOR), the mean was 4.1 ± 1.8 , with a minimum score of 1 and a maximum score of 6. The median score was 5, and the interquartile range varied from 6 to 6. Finally, the intrinsic religiosity index (IR) presented a mean of 8.7 ± 3.9 , with a

minimum score of 3 and a maximum score of 15. The median score was 8, and the interquartile range varied from 5 to 12.

Financial support and leisure activities were factors associated with greater satisfaction with life according to the explanatory model based on multiple linear regression recorded in the SWL variation. Conversely, worse sleep quality and higher anxiety and IR scores were factors associated with lower satisfaction with life (Table 2). The multivariate analysis carried out through the linear regression of the variation in the positive and negative affects evidenced that age and leisure had a positive correlation with positive affects, as well as a negative correlation with negative affects. Poor sleep quality, belonging to the female gender, and higher IR indices were correlated with lower positive affects, whereas high anxiety scores were associated with negative affects and low positive affects (Table 3).

Table 2 - Multivariate regression analyses of the association between subjective well-being and explanatory factors

Explanatory variables	β regression coefficient (95%CI)	p
Gets financial support		
Yes	3.53 (0.76 to 6.31)	0.013
No	Reference	-
Leisure activity		
Yes	3.16 (0.33 to 5.98)	0.028
No	Reference	-
Artistic activity		
Yes	1.35 (-0.18 to 2.88)	0.084
No	Reference	-
How do you classify your sleep in general terms?		
Very good	Reference	-
Good	-2.74 (-5.94 to 0.45)	0.092
Bad	-4.06 (-7.21 to -0.89)	0.012
Very bad	-4.31 (-7.94 to -0.66)	0.021
Hard time keeping awake		
None in the last month	Reference	-
Less than once a week	-1.01 (-2.85 to 0.82)	0.278
1 or 2 times a week	-2.07 (-3.82 to -0.32)	0.020
3 or more times a week	-2.79 (-4.80 to -0.79)	0.006
PSWQ questionnaire		
Worry score	-0.113 (-0.184 to -0.040)	0.002
DUREL		
Intrinsic religiosity	-0.244 (-0.403 to -0.084)	0.003

95%CI = 95% confidence interval; DUREL = Duke Religiosity Index; PSWQ = Penn State Worry Questionnaire. Bold font indicates statistically significant difference ($p < 0.05$).

Discussion

The aim of the present study was to assess the factors associated with SWB, especially religiosity and anxiety, in a sample composed of medical students enrolled in a public university in northeastern Brazil.

The students enrolled in the first four years of the Medical School of UFPE presented medium levels of satisfaction (scores 22-23) with life (score 22.3) and low mean positive affect levels (score 34) (score 32.1). It is important to highlight that these values are the reference in the scale for middle-aged groups, because there is no reference for specific college student groups attending different college courses. Students presenting the highest SWB indices were more satisfied with life and felt more positive emotions, were more involved in leisure activities, had better sleep quality, scored lower on IR and presented lower levels of anxiety. Furthermore, students who had financial support were more satisfied with life. Conversely, students who felt more negative emotions tended to be younger and to belong to the female gender.

The PSWQ is a very useful scale to measure generalized anxiety disorders (GAD) mainly associated

with excessive worry. Scores above 45 are strong GAD indicators²²; the mean PSWQ of medical students in the present study was 41.3 and it showed that the sample tended to worry too much – many students (P75 = 47) could have possibly been diagnosed with GAD at the time the research was carried out. Data in the present study corroborate the literature available about the mental health of medical students worldwide.^{4,23,24} In general terms, high anxiety levels are associated with lower SWB levels⁹; anxious people tend to be worried all the time and it is likely that such permanent anxiety affects uneasy individuals and hinders their well-being.

Overall, spirituality is understood as the personal search for answers to the meaning of life and its relation to holiness and/or to transcendence.²⁵ There is a subgroup (religion/religiosity) linked to spiritual institutions or traditions²⁶; the number of studies on religiosity/spirituality (R/S) has grown exponentially in the last decades,^{26,27} as well as the number of instruments designed to measure R/S.²⁸ Finding an ideal scale to measure R/S is a hard task, especially in countries such as Brazil, characterized by heterogeneous and syncretic religiosity.²⁸ Many scales have been translated into Portuguese, and adapted and validated to Brazil²⁸; one

Table 3 - Multivariate regression analysis of the association between PANAS and explanatory factors

Characteristics	Positive affect		Negative affect	
	β regression coefficient (95%CI)	p	β regression coefficient (95%CI)	p
Sex				
Male	Reference	-	-	-
Female	-2.02 (-3.31 to -0.73)	0.002	-	-
Age (years)	0.33 (0.127 to 0.534)	0.002	-0.021 (-0.04 to -0.003)	0.022
Leisure activity				
Yes	4.05 (1.27 to 6.82)	0.006	-0.51 (-0.77 to -0.25)	0.000
No	Reference	-	Reference	-
How do you classify your sleep in general terms?				
Very good	Reference	-	-	-
Good	-1.74 (-4.92 to 1.45)	0.285	-	-
Bad	-3.35 (-6.48 to -0.218)	0.036	-	-
Very bad	-4.15 (-7.71 to -0.59)	0.022	-	-
PSWQ questionnaire				
Worry score	-0.110 (-0.183 to -0.036)	0.003	0.76 (0.65 to 0.86)	0.000
DUREL				
Intrinsic religiosity	-0.452 (-0.67 to -0.23)	0.000	-	-

95%CI = 95% confidence interval; DUREL = Duke Religiosity Index; PANAS = Positive Affect and Negative Affect Scale; PSWQ = Penn State Worry Questionnaire.

Bold font indicates statistically significant difference ($p < 0.05$).

of the most widely used scales, also used in the current study, is the DUREL-P, which was designed by one of the most remarkable researchers in the area, Prof. Harold Koenig.²¹

There is a general consensus that people who identify themselves as religious tend to report better health and more happiness and SWB, regardless of their religious affiliation, religious activity, work and family performance, social support or financial situation. Studies showing these conclusions were mostly carried out with Western populations.⁹ However, research involving Islamic and Egyptian students has also shown a positive relation between religious affiliation and happiness.²⁹⁻³¹ Surprisingly, the present study showed an inverse relation between IR scores and SWB among the medical students assessed. The other R/S dimensions assessed by DUREL did not show statistically significant associations in the present study. IR is concerned with spiritual orientation, i.e., with the influence of religiosity on the decisions made and on the person's lifestyle. This orientation shows how individuals see religion as their most valuable asset; based on R/S, they consider religion as the strongest meaning of life, and they aim to internalize and fully live with their beliefs.²⁸ Could it be possible that the inverse relation between SWB and R/S was a specific situation for medical students? This is a possible question to be raised; however, many researches involving medical students worldwide have found a positive association between R/S and well-being, or a negative association between R/S and stress.³¹⁻³³ Perhaps, the sample in the present study gives evidence to the trend of excessive self-confidence among medical students. This self-confidence can be extrapolated to their relation to religion. These students' distress may result from their resistance to finding ways to balance religious and academic activities. Accordingly, a study assessing SWB and religious practices has shown a lack of differences between the scores of non-religious and religious people (who do not practice their religion).³⁴

Other studies involving medical school students have also reported a positive association between leisure activities and SWB scores,³⁵ as well as a negative association between leisure activities and stress levels^{1,36}; such reality also includes the elderly and the young population in general.³⁷ It is possible that higher SWB levels lead to better mood and a willingness to perform pleasant activities. In addition, the commitment to perform leisure activities can be associated with better time-handling and/or self-regulation, and consequently, with a stronger sense of competence and well-being, mainly when it comes to the tasks performed by medical school students: the long hours in class and all the extracurricular activities. Conversely,

leisure activities involving interpersonal relationships may lead to some level of social support and to a sense of belonging; therefore, they may increase SWB rates. Leisure activities throughout the years in medical school can help students to decrease stress and make them think about their lives beyond their profession, and avoid developing excessive self-confidence. Actually, some studies have already investigated the likelihood of explaining such self-regulation by associating it with the high well-being scores found among medical residents and physicians,³⁸⁻⁴⁰ with medical students' perception about the need to balance work and lifestyle,⁴¹ and with their perception about social support.⁴²

Previous studies involving the medical population have also evidenced decreased happiness associated with lower sleep quality.⁴³ Sleep disturbances may trigger mental disorders, and psychiatric disorders may trigger sleep issues⁴⁴; poor sleep quality may also lead to attention deficits and to low performance. This may explain the association between poor sleep and lower well-being rates. Sleep can be impaired by the academic shifts, which are not compensated for with subsequent rest, especially during the time people are still attending medical school. Conversely, greater SWB sensations can lead to better sleep quality.

Having financial support may increase satisfaction with life by enabling medical students to deal with fewer sources of anxiety. It means that students who get financial help have one less source of stress, as they do not need to worry about their own subsistence. Such reasoning finds support in the scientific literature about the economic, stress, and happiness aspects involving medical students all around the world.^{1,36,45-48}

The psychiatric literature shows that women present the highest prevalence of depressive and anxiety disorders.^{46,49,50} These disorders are linked to the presence of negative emotions and, along with high stress levels, were also more prevalent among female medical students in most studies assessing similar populations,^{23,24,45,51,52} but not in all of them.⁵³ The present study corroborates such a consensus, since it showed that individuals belonging to the female gender presented more negative emotions and less positive emotions. It is worth highlighting, however, that the present study did not find significant differences in SWL scores between men and women; the same reality was evidenced in medical students from Tehran.⁴⁵ This difference between positive/negative emotions and satisfaction with life is a positive sign of the real existence of two SWB dimensions, namely affective and cognitive.

When it comes to the population as a whole, happiness tends to decrease as people age.^{54,55}

However, age had a positive association with the presence of positive emotions in the current study. The sample assessed, however, does not represent the general population, as it comprised solely medical school students. Some factors may explain this difference: the present sample basically comprised young individuals (mean age: 22 years); the oldest student was 43 years old. Accordingly, the presence of more positive emotions in older students may represent their maturity and ability to manage conflicts inherent to the course, without the physical and social wear that an older age tends to inflict. Thus, older students may have better perceived satisfaction about attending medical school than those who were admitted at an earlier age.

Finally, it is necessary to be careful when interpreting the results of the present study, because it has some limitations. First, the current sample is representative of the studied population, but it is a sample of medical students attending a single public university in a state of northeastern Brazil. Thus, it may be difficult to extrapolate the present results to populations with different profiles, for example, to students in other college courses, or from other medical schools in other Brazilian regions or other countries, or yet to youngsters outside the college environment. Besides, the present study followed a cross-sectional approach, which does not allow causal analyses.

Conclusions

The medical students assessed presented medium satisfaction-with-life levels, low mean levels of positive emotions, and high anxiety levels. Less worry and surprisingly lower IR scores were associated with higher scores in the two SWB parameters (positive emotions and satisfaction with life). Furthermore, leisure activities, good sleep quality, financial support, age and gender were factors associated with the highest SWB scores (with emotional and cognitive components, or with one of these two components). In addition, data in the present study highlighted the need for creating preventive intervention programs to increase SWB through positive psychological techniques and/or to decrease anxiety by using cognitive-behavioral therapy paradigms and/or mindfulness.

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