



Factors associated with happiness and satisfaction with life of medical students in their first four years of a Brazilian private medical school

Fatores associados à felicidade e satisfação com a vida de estudantes de medicina nos primeiros quatro anos de uma faculdade de medicina privada brasileira

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ABSTRACT

Aim: To determine the factors that interfere with students' perceptions of happiness and satisfaction with life during the initial process of adaptation to the college environment. **Material and Methods:** This is a cross-sectional study involving students from the first to fourth years of the medical program at a private school in Brazil. The data were collected using an SurveyMonkey. The students completed a questionnaire to assess daily activities and personal characteristics in addition to the Pemberton Happiness Index (PHI) and Satisfaction with Life Scale (SWLS) instruments. **Results:** The final regression models explained 42.2% and 44.7% of the total variance of the SWLS and PHI scores, respectively. Although personal, school, and out-of-school variables were individually associated with the investigated scores, the personal variables explained most of the score variability overall (57.8% and 55.3% of the SWLS and PHI scores, respectively). **Conclusion:** This study identified and quantified factors (personal, school, and out-of-school) that could be associated with happiness and satisfaction as medical students. Medical students with positive personality traits such as good health perception, optimism, financial satisfaction, and fulfillment as medical students were happier and more satisfied. We hope that that this research provides data for researchers and medical schools to facilitate pedagogical improvements for student evaluation.

Keywords: Medical student, survey, student happiness, student satisfaction.

RESUMO

Objetivo: Determinar os fatores que interferem na percepção de felicidade e satisfação com a vida de estudantes de medicina durante o processo inicial de adaptação ao ambiente universitário. **Material e Métodos:** Trata-se de um estudo transversal envolvendo alunos do primeiro ao quarto ano do curso de medicina de uma escola particular do Brasil. Os dados foram coletados usando o SurveyMonkey. Os alunos preencheram um questionário para avaliar atividades diárias e características pessoais, além dos instrumentos Pemberton Happiness Index (PHI) e Satisfaction with Life Scale (SWLS). **Resultados:** Os modelos de regressão finais explicaram 42,2% e 44,7% da variância total dos escores SWLS e PHI, respectivamente. Embora variáveis individualmente pessoais, escolares e extraescolares estivessem associadas aos escores investigados, as variáveis pessoais explicaram a maior parte da variabilidade geral dos escores (57,8% e 55,3% dos escores SWLS e PHI, respectivamente). **Conclusão:** Este estudo identificou e quantificou fatores (pessoais, escolares e extraescolares) que podem estar associados à felicidade e satisfação com a vida de estudantes de medicina. Os estudantes que apresentaram traços positivos de personalidade, como boa percepção de saúde, otimismo, satisfação financeira e realização como estudantes de medicina, eram mais felizes e satisfeitos. Esperamos que esta pesquisa forneça dados para pesquisadores e escolas médicas para facilitar melhorias pedagógicas, de desempenho e avaliação dos alunos.

Palavras-chave: Estudante de medicina, survey, felicidade dos estudantes, satisfação dos estudante.

INTRODUCTION

Medical training is characterized by a long and intense learning process that often requires students to set aside part of their personal life on behalf of their education^{1,2}. Many students are also influenced by family, social, and political demands, in addition to the stress naturally imposed by the education process, leading to greater physical, mental, and emotional distress³⁻⁵. The first year of medical school is often difficult because students are in the process of adapting to the new curriculum, are experimenting with new teaching methodologies, are leaving town or leaving home for the first time and are often faced with the necessity of establishing new groups with new responsibilities and need to manage their personal and financial lives^{6,7}.

The students are presented with an institutional space with rules and academic tasks that require study skills and higher levels of organization, autonomy, and engagement, which is in line with the difficulties that the students face regarding their new social and personal demands⁸⁻¹⁰. When analyzing the school scene, it is observed that over the last decades, numerous medical schools have been established, especially in Brazil, which must follow the curricular norms set forth in the National Curricular Guidelines for the medical course that provides the pedagogical model for use of active methods of teaching, enabling students to develop critical, reflexive opinions, as well as skills in the search for self-knowledge¹¹. However, a highly relevant item that does not appear in the curriculum guidelines for medical graduation corresponds to the management and prevention of high rates of anxiety, burnout, depression, and suicide that affect medical students^{12,13}. These changes impact students since all the basic training provided in the methodological format centered on the teacher when in the university can generate anxiety until the students adapt to the new pedagogical model¹⁴. Thus, medical schools that consider the importance of the well-being of students have a need to better understand the negative factors that affect students' academic performance⁹. Regarding the methodological question, active methods can have a positive effect on student learning, as they allow a better interpersonal relationship and constant stimulus to solve problems, but pedagogical

disorganization can cause demotivation^{11,15}. In the search to identify negative factors, such as depressive symptoms between a method considered active and another considered traditional, the researchers concluded that both methods led students to a high prevalence of depressive symptoms¹⁴.

However, concerns including the form of learning, motivation to learn, suffering related to apprehension concerning their future profession, financial, family, and health problems are highly present in academic life and often interfere with the learning system^{16,17}. Outside the school environment, some everyday activities are important because they promote a sense of personal well-being, such as regular exercise, good sleep, leisure activities, and interpersonal relationships¹⁸. Understandably, the factors that positively or negatively affect students' everyday lives influence the way the students perceive their lives^{19,20}.

Students with high levels of stress are generally less happy and less satisfied with life. As a result, they are more likely to present social problems, use illicit drugs, and tend to be problematic professionals with little success²¹. Few studies have investigated happiness and satisfaction with medical students' lives with the goal of identifying determinants that promote and limit happiness and satisfaction with life^{9,22,23}.

Thus, our goal was to identify and quantify the importance of factors affecting happiness and satisfaction with the standard of living of medical students under an active learning methodology in their early years of medical school.

MATERIAL AND METHODS

This was a cross-sectional study. Data were collected in June 2015 and June 2016 using an SurveyMonkey® online collector. The study was carried out with medical students from the 1st to the 4th year of the medical course of the Faculty of Health Sciences of Barretos Dr Paulo Prata - FACISB, which is a private institution.

Sample

This was a cross-sectional observational study with prospective data collection. Due to the authorization of the Brazilian Ministry of Education for a gradual increase in the number of new medical student vacancies, FACISB has implemented increasing selective processes. In this way, the authors chose to perform the data collection during two periods, which provided a greater number of participants. The first class (30 students), second class (30 students), third class (60 students), fourth class (60 students) and fifth class (60 students), making up a total of 240 participants, were collected in June 2015. The second period was held in June 2016, referring to the sixth class, which had 90 new students. In total, 330 students were invited to participate in the study. The medical course spans six years (comprising twelve separate semesters) typically divided into three stages, each averaging two years: preclinical, clinical, and internship. All students officially enrolled in the medical course were invited to participate.

Ethical issues

The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and Resolution of the National Health Council no. 466/2012 and was approved by the Ethics Committee of the Cancer Hospital of Barretos (n° HCB 1,130,726/2015 and CAAE-45741115.2.0000.5437). The volunteers provided consent to participate in the study through the informed consent form included in the survey form. The informed consent form (ICF) was included in the online program.

Data collection

The medical students were initially made aware of the study through an informative email and WhatsApp messages with the goal of disseminating the study within the educational institution. After the first email and WhatsApp message, a second contact was made to invite the students to participate in the study. SurveyMonkey® (<https://pt.surveymonkey.com>) was used to apply the instruments. After reading the terms of free and informed consent, the first question referred to the student's intention or not to participate in the research. Those who agreed to participate were referred to a next question that aimed to assess the age of the participant and then continued to evolve until the questionnaires were completed. The students

who eventually did not want to participate simply noted "no" in the ICF, and the survey was closed automatically with a thank-you note. The question of age was also selective, since only students aged at least 18 years were able to respond to subsequent questions.

Eligibility criteria

Students included in the study were those enrolled in the first four years of the Barretos School of Health Sciences, Dr. Paulo Prata undergraduate medical course who voluntarily agreed to participate by signing the consent form.

Assessment instruments

Sociodemographic data (gender, age, marital status, stage of course, ethnicity/race, children, total family income, work, and religious affiliation) and variables related to the everyday life of medical students were included in the survey, evaluating the positive and negative aspects of each variable for later association.

The variables to be investigated were based on the work developed by Dyrbye et al. (2005), who accurately studied the causes and consequences of stress on the medical student, allowing the definition of groups of categories employed in this work as follows: personal, school and out-of-school. To elaborate the everyday activities questionnaire, the meaning of the term described as "which occur daily" was considered²⁴⁻²⁶. Based on the study developed by Moreira et al. (2006), this research also utilized a qualitative methodology with a semistructured interview and categorical thematic content analysis, in which it was possible to identify variables of family and personal influence and factors that influence the course of medicine.

In the questions about the daily life of the medical student, the researchers used the observational criterion described by Campos (2004) and structured by Silva and Fossá (2015), in which classification of the data was organized in themes/categories to facilitate the understanding of the researchers. At the end of the process, the completed questionnaire contained 18 questions that were categorized in the personal, extracurricular (outside the educational environment), and school domains, with questions encompassing satisfaction with

the medical course, family relationships, leisure activities, motivation for study, and others. Below are some examples of questions related to the daily activities of medical students: Do you currently feel like a medical student? His current study routine is: (exhaustive, not exhaustive...); How satisfied are you with your evolution as a medical student? It is important to emphasize that this questionnaire was not validated and did not include a psychometric analysis to evaluate, among others, its internal consistency.

Additionally, the students completed the Pemberton Happiness Index (PHI) and Satisfaction with Life Scale (SWLS) instruments.

Pemberton happiness index (PHI)

The PHI was designed to measure happiness in the general population. This index consists of 11 items related to different domains of remembered well-being (General well-being; Eudaimonic well-being: life meaning, self-acceptance, personal growth, relatedness, perceived control, and autonomy; Hedonic well-being: positive affect and negative affect; and social well-being) and 10 items related to experienced well-being (positive experiences and negative experiences that occurred the previous before). The sum of the corresponding scores produces a combined well-being index (total PHI)²⁷. Recently, the PHI was validated in the Brazilian population through electronic media with Cronbach's alpha values ranging between 0.89 and 0.91²⁸. In the present study, only the total PHI scores were used, with a Cronbach's alpha of 0.80.

Satisfaction with life scale (SWLS)

The SWLS consists of five items that assess the cognitive component of the SWL: 1. In most ways, my life is close to my ideal; 2. The conditions of my life are excellent; 3. I am satisfied with my life; 4. So far, I have gotten the important thing I want in life; and 5. If I could live my life over, I would change almost nothing. These items are answered on a seven-point scale ranging from a score of one (strongly disagree) to seven (strongly agree)^{29,30}. In the Brazilian validation study, the SWLS was named Escala de Satisfação com a Vida (ESV) and had a Cronbach's alpha of 0.89. This scale is a brief, simple, and multiple-item scale with a single-factor structure, and thus it is widely used to assess global

satisfaction with life. The SWLS has been applied in various languages and cultures and has exhibited satisfactory psychometric properties³¹. The SWLS has been validated for use in internet surveys and in the present study exhibited a Cronbach's alpha of 0.86.

Data analysis

The sample was characterized using frequency and/or contingency tables for qualitative variables, and measures of central tendency and dispersion (mean, median, standard deviation, minimum and maximum) for quantitative ones.

To verify the association between the life satisfaction score (SWLS), happiness (PHI), and year of graduation, we used the Kruskal-Wallis test. Subsequently, multiple comparisons (post-hoc test) were performed using the Mann-Whitney test with the Bonferroni method to determine significance. Variables with $p < 0.2$ were selected for the multivariate analysis.

To verify the joint association (multivariate analysis) of the variables with the satisfaction score with life and happiness, a linear regression was used, in which the model was adjusted for the year of graduation and, in each subsequent model, the blocks of variables (personal, school, and out-of-school). To select the significant variables ($p < 0.05$) within each block, the stepwise-forward selection method was used. Thus, the final model included all the variables that were considered significant in bivariate analysis. The Statistical Package for the Social Sciences (SPSS for Windows, 20.0) was used for statistical analysis. The adopted significance level was 5%.

RESULTS

Sample description

Of a total of 330 medical students enrolled from the 1st to the 4th year, 50 (12.06%) did not open the link to the data collector, one student (0.4%) read the consent form and did not agree to participate in the research, and 279 (81.81%) answered only the sociodemographic questionnaire. Of the 279 students, 16 (10.6%) did not respond fully to the PHI questionnaire, and 15 (10%) did not respond fully to the SWLS questionnaire. Thus, 263 and

262 respondents were analyzed in relation to these questionnaires, respectively. The mean (SD) age was 21.75 (9.3) years, with a range from 18 years to 36 years.

The majority of the respondents were single (n=263, 94.9%) and female (n=183, 66.1%). Regarding family income, 38.8% (n=107) reported a monthly income between 5 and 10 minimum wages, and 48 (17.4%) had a monthly income of more than 20 minimum wages. Five students (1.8%) reported working outside the study period (work unrelated to medical graduation). Regarding skin color, 267 (95.6%) reported white, 2 (0.7%) brown, 2 (0.7%) black, and 8 (2.8%) yellow. The respondents encompassed students from each year of the medical course, with the first year having the highest response rate of 118 (42.6%) because information was collected from two 1st year classes, followed 59 (21.3%) from the 2nd year, one from the 3rd year, and 51 (18.4%) and two groups from the 4th year. Regarding religion, most participants were self-referred to as Catholic (n=157, 49.8%), followed by spiritists (n=46, 16.4%), and evangelicals (n=21, 7.5%). Fifty-five (19.6%) reported that they had no formal religion.

Bivariate analysis

Satisfaction with life

The satisfaction with life scores of the medical students varied with the school year (p=0.023), with higher scores obtained from 3rd year students compared with the other years. Among the personal variables, self-perceived health (p<0.001), knowledge of any health problem (p=0.026), being optimistic or not (p<0.001), satisfaction with financial aspects (p=0.001), and fulfillment as a medical student (p<0.001) showed associations with levels of satisfaction with life. Regarding school characteristics, the average time spent in school (p=0.001), motivation to study (<0.001), perceived importance for colleagues (p<0.001), and satisfaction as a medical student (p<0.001) had significantly different scores based on satisfaction with life. Among the out-of-school characteristics, the frequency of family gatherings (p<0.001), having a religion or not (p=0.043), perception of the importance of religious/spiritual life (p<0.001), and regular physical activity (p=0.046) were significantly associated with

satisfaction with life scores (Table 1).

Happiness

Similar to our findings for satisfaction with life, the total PHI scores differed significantly according to the school year (p=0.009). Among the personal variables, self-perceived health (p<0.001), being optimistic or not (p<0.001), perception of fulfillment as a medical student (p<0.001), and financial satisfaction (p=0.002) were associated with the happiness scores. In the school domain, the variables associated with the happiness scores were school activities beyond those included in the undergraduate program (p=0.035), average time spent in the school per day (p=0.004), wear or dissatisfaction as a medical student (p=0.024), motivation to study (<0.001), perception of importance for colleagues (p<0.001), and satisfaction as a medical student (p<0.001). The out-of-school variables with significantly different happiness scores were the frequency of family gatherings (p<0.001), frequency of leisure activities (p=0.003), perception of the importance of religious/spiritual life (p<0.001), and regular physical activity (p=0.001) (Table 1).

Multivariate analyses

Satisfaction with life

The hierarchical linear regression model was initially fitted to the school year and to the sociodemographic data, and a block of variables was added at each step. The school year and sociodemographic data could explain only 7% of the variance in the satisfaction with life score, and this analysis was adequate for significance F (p<0.05). The inclusion of variables related to the personal, school, and out-of-school domain caused a change in the variability of the score, as explained by the model, of 16.5% (p<0.01), 5.4% (p<0.01), and 3.3% (p<0.05), respectively. Finally, model 4 could explain 42.2% of the variance of satisfaction with life scores, and 57.8% of this variability should be explained by other factors that were not addressed in this study. Students with good self-perceived health ($\beta=2.663$, p=0.001) and optimism ($\beta=1.554$, p=0.022) and who were fulfilled as medical students ($\beta=2.734$, p=0.002), considered colleagues important ($\beta=2.352$, p=0.002), and believed that religious/spiritual life was important ($\beta=1.530$, p=0.028), were significantly more satisfied

Table 1. Association of satisfaction with life scores with the school year and personal, school, and out-of-school variables of medical students.

Characteristics	Happiness			Satisfaction with life		
	N	Median (IQR)	p	N	Median (IQR)	p
School Year			0.009			0.023**
1st Year	113	6.33 (5.50-7.50)		113	25 (20-28)	
2nd Year	56	7.08 (6.04-7.88)		56	26 (20-29)	
3rd Year	47	7.25 (6.33-7.83)		47	28 (23-30)	
4th Year	47	6.42 (5.33-7.58)		46	26 (21-29)	
Personal domain						
Sex						
Female	175	6.75 (5.75-7.58)	0.482	174	26 (20-29)	0.859*
Male	88	6.83 (5.58-7.75)		88	26 (21-29)	
Family income^a						
≤ \$3,000.00	134	6.63 (5.58-7.50)	0.238	134	25 (20-29)	0.107*
≥ \$3,000.00)	129	6.92 (5.75-7.75)		128	26 (21.5-29)	
Self-perceived health						
Poor	83	5.92 (5.08-6.75)	<0.001	83	22 (19-25)	<0.001*
Good	180	7.17 (6.25-7.83)		179	28 (23-30)	
Some health problems						
Yes	62	6.46 (5.42-7.50)	0.103	62	23.5 (20-28)	0.026*
No	201	6.83 (5.75-7.67)		200	26 (21-29)	
Optimism						
Not optimistic	156	6.38 (5.46-7.33)	<0.001	155	25 (20-28)	<0.001*
Optimistic	107	7.25 (6.17-7.92)		107	27 (24-30)	
Financial satisfaction						
Unsatisfied	76	6.29 (5.25-7.21)	0.002	76	22 (19-28)	0.001*
Satisfied	187	7.00 (5.92-7.75)		186	26 (22-29)	
Fulfillment as medical student						
No	55	5.92 (4.67-6.75)	<0.001	55	21 (18-26)	<0.001*
Yes	208	7.00 (6.04-7.71)		207	27 (22-29)	
School domain						
School activities						
Undergraduate program + other	212	6.88 (5.79-7.67)	0.035	211	26 (21-29)	0.308*
Only undergraduate program	51	6.25 (5.17-7.42)		51	26 (20-29)	
Average number of hours spent in school/day						
Up to 12 hours	239	6.92 (5.92-7.67)	0.004	238	26 (21-29)	0.001*
More than 12 hours	24	5.83 (4.96-6.50)		24	20 (18.5-24.5)	
Wear or dissatisfaction as student						
Yes	254	6.75 (5.67-7.58)	0.024	253	26 (20-29)	0.418*
No	9	7.92 (6.92-8.17)		9	26 (25-29)	

Motivation to study							
	No	88	6.00 (5.00-7.21)	<0.001	88	22 (19-28)	<0.001*
	Yes	138	7.21 (6.33-7.92)		137	27 (24-30)	
Study routine							
	Exhausting	176	6.75 (5.58-7.63)	0.618	175	25 (20-29)	0.938*
	Not exhausting	87	6.75 (6.00-7.58)		87	26 (20-29)	
Considers oneself important for colleagues							
	No	93	6.00 (4.92-6.83)	<0.001	93	22 (19-27)	<0.001*
	Yes	170	7.25 (6.25-7.83)		169	27 (23-30)	
Satisfaction as student							
	Unsatisfied	126	6.17 (5.17-7.25)	<0.001	125	22 (20-27)	<0.001*
	Satisfied	137	7.25 (6.33-7.83)		137	28 (24-30)	
Out-of-school domain							
Frequent family gatherings							
	No	159	6.33 (5.50-7.42)	<0.001	159	24 (20-29)	<0.001*
	Yes	104	7.25 (6.29-7.83)		103	27 (23-30)	
Moments of leisure							
	No	226	6.58 (5.58-7.58)	0.003	225	25 (20-29)	0.096*
	Yes	37	7.50 (6.75-8.00)		37	24 (20-28)	
Has a religion							
	No	53	6.42 (5.42-7.42)	0.079	53	26 (21-29)	0.043*
	Yes	210	6.92 (5.83-7.67)		209	25 (20-28)	
Influence of religious/spiritual life in their studies							
	No	166	6.42 (5.42-7.33)	<0.001	165	28 (22-30)	<0.001*
	Yes	97	7.33 (6.25-7.83)		97	24 (20-28)	
Physical activity							
	No	79	6.17 (5.25-7.17)	0.001	79	26 (21-29)	0.046*
	Yes	184	7.08 (6.00-7.67)		183	24 (15-29)	
Considers oneself important for family members							
	No	4	6.33 (4.67-7.54)	0.567	4	26 (20-29)	0.567*
	Yes	259	6.75 (5.75-7.58)		258		

^aValue (Brazilian currency) converted into dollars; * Mann-Whitney test; ** Kruskal-Wallis test.

with life. Conversely, students who spent more than 12 hours in school reported less satisfaction with life ($\beta=-2.496$, $p=0.037$) (Table 2).

Happiness

Regarding the total PHI scores, block 1 (school year and sociodemographic factors) alone explained 5.4% of the variance of the happiness scores. The inclusion of variables related to the personal, school,

and out-of-school domain caused a change in the variability of the score, as explained by the model, of 24.8% ($p<0.01$), 10.7% ($p<0.01$), and 3.9% ($p<0.05$), respectively. The final model explained 44.7% of the variance of the happiness scores, and 55.3% of this variability should be explained by other factors that were not addressed in this study. The significant variables at the end of the inclusion of the four blocks of variables had very similar effects on the model for

Table 2. Hierarchical multiple linear regression model for satisfaction with life fitted to the school year and personal, school, and out-of-school domains of medical students.

Variables	Model 1		Model 2		Model 3		Model 4	
	B	P	B	P	B	p	B	p
Block 1 – School year and sociodemographic factors								
2nd year (0, no; 1, yes)	1.207	0.232	0.063	0.944	-0.627	0.477	-0.892	0.319
3rd year (0, no; 1, yes)	3.597	0.001	1.979	0.041	0.996	0.304	0.684	0.477
4th year (0, no; 1, yes)	1.549	0.168	-0.076	0.938	-0.974	0.323	-1.194	0.221
Sex (0, female; 1, male)	0.793	0.326	-0.356	0.619	0.037	0.958	0.278	0.696
Age (year)	-0.226	0.121	-0.257	0.043	-0.210	0.089	-0.187	0.128
Family income (0, ≤\$3,000.00; 1, ≥\$3,000.00) (1*)	1.000	0.191	0.561	0.422	0.554	0.416	0.794	0.258
Block 2 – Personal								
Self-perceived health (0, poor; 1, good)			3.364	<0.001	2.711	0.001	2.663	0.001
Any health problem (0, no; 1, yes)			-0.803	0.295	-0.773	0.309	-0.633	0.403
Optimism (0, no; 1, yes)			2.471	<0.001	1.692	0.013	1.554	0.022
Financial satisfaction (0, no; 1, yes)			2.181	0.004	1.621	0.033	1.365	0.071
Fulfillment as medical student (0, no; 1, yes)			3.505	<0.001	2.953	0.001	2.734	0.002
Block 3 – School								
Average number of hours in school/day (0, <12 h; 1, >12 h)					-2.269	0.059	-2.496	0.037
Motivation for studies (0, no; 1, yes)					0.427	0.581	0.394	0.605
Considers oneself important for colleagues (0, no; 1, yes)					2.351	0.002	2.352	0.002
Satisfaction as a student (0, no; 1, yes)					0.702	0.336	0.667	0.358
Block 4 – Out-of-school								
Frequent family gatherings (0, no; 1, yes)							0.900	0.172
Leisure time (0, no; 1, yes)							0.666	0.458
Is religions/spiritual (0, no; 1, yes)							0.465	0.564
Influence of religious/spiritual life in their studies (0, no; 1, yes)							1.530	0.028
Physical activity (0, no; 1, yes)							-0.676	0.374
R2	0.070	0.335	0.389	0.422				
Change in R2		0.265	0.054	0.033				
F	0.014**							
F change			4.670***	2.344**				

(1*)Value (Brazilian currency) converted into dollars; * p<0.10; ** p<0.05; *** p<0.01.

Table 3. Hierarchical multiple linear regression model for happiness scores fitted to the school year and personal, school, and out-of-school domains of medical students.

Variables	Model 1		Model 2		Model 3		Model 4	
	B	P	B	P	B	p	B	p
Block 1 – School year and sociodemographic								
2nd year (0, no; 1, yes)	0.475	0.067	0.201	0.386	-0.067	0.764	-0.139	0.537
3rd year (0, no; 1, yes)	0.827	0.003	0.437	0.082	0.064	0.794	-0.025	0.918
4th year (0, no; 1, yes)	0.117	0.680	-0.0293	0.251	-0.629	0.013	-0.713	0.004
Sex (0, female; 1, male)	0.260	0.208	-0.007	0.969	0.131	0.464	0.183	0.308
Age (year)	-0.024	0.519	-0.030	0.368	-0.017	0.579	-0.011	0.719
Family income (0 ≤\$3,000.00; 1, ≥\$3,000.00) (1*)	0.016	0.934	-0.119	0.509	-0.098	0.565	-0.067	0.701
Block 2 – Personal								
Self-perceived health (0, poor; 1, good)			0.796	<0.001	0.542	0.006	0.481	0.016
Any health problem (0, no; 1, yes)			0.173	0.384	-0.182	0.342	-0.161	0.397
Optimism (0, no; 1, yes)			0.572	0.001	0.309	0.071	0.274	0.105
Financial satisfaction (0, no; 1, yes)			0.615	0.002	0.387	0.043	0.318	0.093
Fulfillment as medical student (0, no; 1, yes)			0.892	<0.001	0.698	0.001	0.649	0.003
Block 3 – School								
Undergraduate student only (0, no; 1, yes)					-0.209	0.366	-0.281	0.225
Routine of studies exhaustive (0, no; 1, yes)					0.392	0.359	0.342	0.422
Average number of hours in school/day (0, <12 h; 1, >12 h)					-0.483	0.113	-0.533	0.078
Motivation for studies (0, no; 1, yes)					0.258	0.187	0.246	0.199
Considers oneself important for colleagues (0, no; 1, yes)					0.864	<0.001	0.838	<0.001
Satisfaction as a student (0, no; 1, yes)					0.149	0.413	0.124	0.490
Block 4 – Out-of-school								
Frequent family gatherings (0, no; 1, yes)							0.326	0.048
Leisure time (0, no; 1, yes)							0.255	0.265
Has Religion (0, no; 1, yes)							0.118	0.557
Influence of religious/spiritual life in their studies (0, no; 1, yes)							0.365	0.035
Physical activity (0, no; 1, yes)							-0.062	0.745
R2	0.054	0.302	0.409	0.447				
Change in R2		0.248	0.107	0.039				
F	0.058*							
F change			6.273***	2.839**				

(1*)Value (Brazilian currency) converted into dollars; * p<0.10; ** p<0.05; *** p<0.01.

satisfaction with life. Unlike the model for satisfaction with life, 4th year students were less happy than 1st year students ($\beta=-0.713$, $p=0.004$), and students who reported good self-perceived health ($\beta=0.481$, $p=0.016$), who were fulfilled as medical students ($\beta=0.649$, $p=0.003$), who considered colleagues important ($\beta=0.838$, $p<0.001$), who had a higher frequency of family meetings ($\beta=0.326$, $p=0.048$), and who believed that religious/spiritual life was important ($\beta=0.365$, $p=0.035$) were happier (Table 3).

DISCUSSION

The results of this study revealed that 42.2% of life satisfaction scores can be explained by the variability obtained by the multivariate analysis and were associated with the perception of good health, optimism, consideration of the importance of colleagues, and the influence of religious/spiritual practices during studies. Regarding the results regarding the happiness of medical students, 44.7% of the happiness scores could be explained by the statistical model. However, the 4th year students of medicine were less happy compared with the other years. It is important to note that the happiest students were those who claimed to be healthy and participated in religious/spiritual practices related to their studies, such as prayer groups.

The 3rd-year students were more satisfied than the 1st, 2nd, and 4th-year students. In the multivariate analysis, the 4th-year students reported being less happy. Because the proposed model was able to explain only 3.9% of this feature, the great variability associated with the lower rates of happiness may be related to the period preceding medical internship for initiating extracurricular activities. In this case, these students might be experiencing feelings of apprehension, fatigue, as well as an absence of leisure time and greater sleep deprivation. However, this conjecture requires further investigation. In a review of students' quality of life, the study authors, using the Student Perception Report, have described that regardless of the school, period, or country, students are subjected to several negative interference factors, for which the consequences cannot be fully foreseen³². The 1st-year students may experience lower levels

of happiness because they may experience adaptive problems to the new university life, feelings of professional ineffectiveness, the process of adaptation to study models, sleep deprivation, poor diet, and lack of exercise, which can contribute to high levels of dissatisfaction³⁴. The 3rd-year students seemed to be happier, which can be argued to be associated with the proximity to practical curricular activities, such as surgical technique, pathology, and clinical pharmacology classes, allowing the student to experience a closeness to the reality of the medical profession and, thus, feel happier during this period with reduced feelings of professional ineffectiveness^{33,34}.

According to Amaral et al. (2008), Brazilian 3rd and 4th-year medical students tended to be more stressed, and 26.8% of these students had depressive symptoms, low self-esteem, and excessive fatigue³⁵.

Approximately 25% of the variance of the evaluated constructs referred to the personal domain. Eley et al. (2016) have shown that the variability found in the personality-driven profile may be broad among students because they are unique. This information helps us to understand why at least 60% of the findings in our studies cannot be explained by the instrument. Thus, it is possible to understand that personal factors can be broad and subjective and that the happiness and satisfaction with life of students cannot be explained in totality, although there are strong personal characteristics meriting further investigation to improve the well-being, motivation, emotional stability, and performance of medical students³⁶⁻³⁹.

The school environment can cause stress and anguish among undergraduate students⁴⁰, thereby decreasing levels of happiness. However, our data showed that the school domain explained less than 10% of the levels of happiness as a whole. Although the variables were carefully selected, other relevant study variables were not investigated in the present study. A quoted example concerns whether medical school ensures that students who are fragile are psychologically assisted or inserted into some psychosocial monitoring program⁴¹.

Factors external to the school environment associated with religiosity and spirituality can influence satisfaction with life and happiness. Holder

et al. (2016) showed that spirituality represented 21% of the variance in the satisfaction with life and happiness of teenagers. However, in our findings, the out-of-school factor explained only 2% of the effect on students. The students who lived with their families were happier than those who did not live in the same home¹; these data corroborated our findings because we observed that students who had family gatherings more frequently were happier.

Students who were optimistic and had better self-perceived health seemed to be happier and more satisfied in our study. Although the results obtained in this study have not been compared to other medical schools with similar or different methodological characteristics, medical school students with active learning methodologies are known to have positive personal characteristics and a greater coping capacity and are happier and more emotionally stable⁵.

Our results combined with results from previous studies^{8,9,22,35,42} may provide information for researchers and medical schools seeking to understand the student profile for improvement. Although the results show a strong relationship between personal characteristics (intrinsic to the individual) and levels of happiness and satisfaction with life, medical school can provide a healthy and welcoming environment for academic development and support for students experiencing difficulties in the learning process.

Limitations

This study was conducted at a single private medical school representing 1 of more than 303 existing schools, which diminishes the generalization power of the study findings. Within the construction of personal variables, an evaluation of personality measures would be interesting. This study compared scores of happiness and satisfaction with the lives of students from different school years, but the authors acknowledge that a longitudinal assessment of these students would be a more appropriate approach.

CONCLUSION

This study identified and quantified factors (personal, school, and out-of-school) that could be associated with happiness and satisfaction as medical

students. Most of the variation was explained by personal factors and, to a lesser degree, by school and out-of-school factors. Medical students with positive personal traits such as good health perception, optimism, financial satisfaction, and fulfilment as medical students were happier and more satisfied. We hope that this research can provide data for the development of pedagogical instruments for medical school evaluations.

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Received: 15.09.2022

Accepted: 22.11.2022