

Factors associated with medical students' quality of life in a Brazilian northeast countryside university

Fatores associados à qualidade de vida dos estudantes de medicina no interior do Nordeste brasileiro

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ABSTRACT

Introduction: The current policy of interiorization of medical education worldwide and the application of active methods, as well as the lack of consensus regarding the factors associated with medical students' quality of life are topics of discussion in the medical literature.

Objective: In view of the scarcity of analyses on the subject, this study aimed to evaluate the topic at a medical school in a Brazilian northeast countryside university.

Method: Cross-sectional study, developed from March to May of 2018. The questionnaire WHOQOL-bref was used to evaluate the quality of life and the data were related to: sociodemographic characteristics, anthropometric data and lifestyle. Data analysis was performed using descriptive statistics; then, a bivariate analysis was performed with a test for comparison of mean scores aimed to identify possible variables associated with the investigated domains. Binary logistic regression was performed to identify possible factors associated with poor quality of life in the investigated domains. The statistical analysis estimated 95% CI and p-value <0.05.

Results: The present study characterized the students' quality of life and identified the following factors as being associated with poor quality of life: female gender, attending preclinical years, being a smoker, having normal weight classified according to the body mass index, having a negative assessment of their own health and quality of life. The results also showed that most students had a negative evaluation regarding the physical, psychological and environmental domains; in contrast to the social relationships domain, in which most reported a positive assessment.

Conclusion: The findings allow discussions about measures aimed at dealing with factors that affect the quality of life of medical students attending medical schools located in remote and rural regions.

Keywords: Quality of Life; Medical Students; Mental Health; Medical Education; Rural Areas.

RESUMO

Introdução: A atual política de interiorização da educação médica mundial e a aplicação de métodos ativos, bem como a falta de consenso sobre os fatores associados à qualidade de vida dos estudantes de Medicina, são conhecidos temas de discussão na literatura médica.

Objetivo: Tendo em vista a escassez de análise sobre o assunto, este estudo teve como objetivo avaliar a qualidade de vida entre os estudantes de Medicina de uma universidade do interior do Nordeste brasileiro.

Método: Trata-se de um estudo transversal, desenvolvido de março a maio de 2018. Utilizou-se o questionário WHOQOL-bref para avaliar a qualidade de vida, e os dados foram relacionados a características sociodemográficas, dados antropométricos e estilo de vida. Analisaram-se os dados por meio de estatística descritiva, e, em seguida, fez-se a análise bivariada com teste para comparação das médias dos escores, a fim de identificar possíveis variáveis associadas aos domínios investigados. Realizou-se regressão logística binária para identificar possíveis fatores associados à pior qualidade de vida nos domínios investigados. A análise estatística estimou IC 95% e valor de $p < 0,05$.

Resultado: O presente estudo caracterizou a qualidade de vida dos estudantes de Medicina e identificou como principais fatores associados à má qualidade de vida: ser do sexo feminino, cursar anos pré-clínicos, ser fumante, ter peso normal classificado pelo índice de massa corporal e apresentar uma avaliação negativa da própria saúde e da qualidade de vida. Os resultados também evidenciaram que a maioria dos estudantes apresentou uma avaliação negativa nos domínios físico, psicológico e meio ambiente, em contraste com o domínio relações sociais, ao qual a maioria atribuiu uma avaliação positiva.

Conclusão: Os achados permitem discutir acerca de medidas voltadas a lidar com fatores que prejudicam a qualidade de vida de alunos de escolas de Medicina em regiões remotas e rurais.

Palavras-chave: Qualidade de Vida; Estudantes de Medicina; Saúde Mental; Educação Médica; Zona Rural.

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INTRODUCTION

The need to bring medical practice into rural areas and remote populations has been observed worldwide¹⁻³. Since the beginning of their undergraduate course, students are exposed to the reality of the community in which they operate, allowing for early professional practice and longitudinal preceptorship throughout their medical education to train community-oriented doctors¹. These factors contribute to the development of students' skills, increasing the confidence on their professional performance in the rural environment². Based on this, the aim is to increase students' interest in rural medicine and facilitate their permanence and fixation in remote territories after graduation, where they might build their professional life². The rural community-based medical education, as a new approach, can make students concerned about learning in a different environment, especially whether the teaching would meet the academic requirements of their national exams³.

During medical training, stressors are potent depressants of students' quality of life, which cause problems related to their health in its broadest concept⁴. The continuous pressure to learn a large amount of information, the lack of time for social activities, the recurring contact with illness and death, the large and progressive teaching load and, consequently, the lack of time dedicated to personal life, self-care and leisure are some of the factors that negatively impact these students' quality of life⁵⁻⁷. Studies have shown that the type of curriculum and health lifestyle related to eating habits, sleep and physical activity modify the quality of life of medical students^{8,9}.

In this context, the selection process itself for a medical degree in Brazil is one of the most popular and, therefore, most difficult to access¹⁰. Therefore, before entering university, students wishing for a medical career need to set aside much of their time to study and prepare to compete for a place in the desired course¹¹.

Following the worldwide trend towards the interiorization of medical practice, in October 2013, the *Mais Médicos* Program (Law 12,871/2013) was instituted, determining changes in the logic of education in Brazilian medical schools¹². Among the program's relevance, the increase in the number of vacancies for medical training stands out, based on the interiorization of education, previously concentrated only in large urban centers and, since then, including rural areas, remote areas and those lacking infrastructure, in order to reduce regional health inequalities and reduce the scarcity of doctors in priority regions for the *Sistema Único de Saúde* (SUS), the public health system in Brazil¹.

Also noteworthy is the new National Curriculum Guidelines for the medical course, as it updated medical education to the challenges of contemporary education; placing

student protagonism in the center of education; integrating the teaching–research–extension; incorporating information and communication technologies; and by directing physician training to the real health needs of the population and the public health system¹³⁻¹⁴.

Based on this conjuncture, in 2014, the “Escola Multicampi de Ciências Médicas (EMCM)” in Rio Grande do Norte, a Brazilian northeastern state, started its activities, inserting itself into a scenario away from the great urban centers and incorporating a 100% active methodology in its curriculum, such as *problem-based learning* (PBL), in which the student takes the lead in the teaching-learning process. In this context, new teaching methodologies, such as PBL, are included as strategies aimed to improve the medical educational environment¹⁵⁻¹⁸.

The high level of PBL student self-efficacy is directly associated with a lower sense of social isolation in rural settings, and a better subjective experience of belonging to these communities or geographical areas to build their careers in these locations¹⁹.

Furthermore, the majority of students attending the school is from other cities and, therefore, submitted to change of residence and family absence. In the municipality where the medical school is located, there are no cinemas, shopping malls, parks, and neither the habit of hosting parties or concerts. Due to the restricted leisure options, such as going to snack bars, restaurants, bars and religious services, the territory is quite convenient for data collection, since the offered opportunities are possible sources of overweight, obesity and alcoholism development and directly impact the quality of life of the population. This scenario of interiorization and active methodologies triggers anxiety and stress due to pressure on the academic education quality, social claims on the demands of the labor market and insecurities regarding the training process quality¹⁵.

It is known that the educational environment in which students are trained has an important impact on quality of life, reflecting their satisfaction with the course, sense of well-being and aspirations¹⁶⁻¹⁷.

Due to the current policy of interiorization of medical education in Brazil, as well as the lack of consensus regarding the factors associated with the medical students' quality of life, it is necessary to continue the investigation on this topic, resulting in findings to support future discussions about quality of life.

The present study aimed to evaluate the quality of life of medical students at the Multicampi School of Medical Sciences of Rio Grande do Norte (EMCM) and to identify factors associated with a poor quality of life. Based on the challenges imposed by the practice of rural medicine, such as isolation, the tyranny of distance and the challenge of remote support²⁰, the

novelty of this study is the hypothesis that the interiorization scenario – far from the large urban centers and with few leisure options – as well as the teaching methodology adopted – that imposes on the student an active posture with more pressure and self-demands in the fulfillment of the tasks – influence the quality of life of EMCM medical students. In addition, we seek to establish strategies such as the use of technologies aiming to overcome the usual difficulties associated with rural and remote professional development for health professionals²⁰.

MATERIAL AND METHODS

Study Characterization

This is a cross-sectional analytical study, conducted from March to May 2018.

Research Scenario

The study was conducted at Escola Multicampi de Ciências Médicas do Rio Grande do Norte/UFRN (EMCM), in Caicó, state of Rio Grande do Norte, Brazil, which started its activities in July 2014, with the first medical school course. Forty vacancies are offered for the medical school annually through the ENEM/SiSU, a national High School leaving exam and a selection system in a digital platform.

The learning curriculum in EMCM is divided into similar workloads between: problem-based learning (PBL); community-based teaching; and traditional theoretical classes, outpatient appointments and hospital practices and team-based learning (TBL).

Caicó is a medium-sized municipality located in the countryside of Rio Grande do Norte, distant 282 km from Natal, the state capital. It has an HDI of 0.71 and approximately 70,000 inhabitants.

Population and Sample

The target audience were students from EMCM attending the first four years of medical school. All students were invited to participate except for the 04 students who were directly involved in the research and data collection.

Inclusion criteria

Being effectively enrolled in EMCM Medical School.

Exclusion criteria

Not completing the questionnaire or declining to take part in the study after receiving information about the research.

Procedures and Data Collection

Data were collected from March to May 2018 by a team of four medical students, properly trained to apply the collection

instruments, that is, to clarify doubts regarding the completion of the questionnaire and to calibrate the equipment for measuring anthropometric data (weight, height, hip and waist circumference).

The students were invited to participate in the research after or before classes (educational activities), informed about the study objectives and methods, making the participation voluntary by signing the free and informed consent form. The printed questionnaire was delivered to the participants and the anthropometric data collection was performed at that same moment, in person. It took students about 15 minutes to fill in the questionnaire.

The information collected was related to: sociodemographic characteristics, anthropometric data, life habits, quality of life evaluation.

Sociodemographic characteristics

The following information was collected: gender, age, skin color/ethnicity, marital status, paid work, academic scholarship, entry year.

Anthropometric data

The anthropometric measurements, individually obtained by the researchers using standardized instruments (scale and measuring tape) were: weight and height to obtain the body mass index (BMI); and hip and waist circumference to obtain waist/hip ratio (WHR). The WHR was classified according to age and gender, following the Ministry of Health (government sector responsible for the administration and maintenance of public health in Brazil) guidelines for: low cardiovascular risk, moderate cardiovascular risk, and high cardiovascular risk.

Life Habits

The assessed life habits were: alcohol and tobacco consumption, physical activity and religious practice. The questions regarding the consumption of tobacco and alcohol and about religious practice were taken from the VIGITEL questionnaire, validated for the Brazilian population and which is part of a national household sample survey (PNAD, *Pesquisa Nacional por Amostra de Domicílio*).

Alcohol and tobacco consumption was investigated by asking whether the individual consumed alcohol and/or tobacco products, and how often a day/week. Physical activity practice was investigated by asking the students whether they had practiced any type of physical exercises and/or sports in the previous three months and how often. Regarding religious practice, the student was asked whether they practiced any religion or if they participated in religious or spiritual movements.

Quality of life

To assess quality of life, the *World Health Organization Quality of Life – Bref* (WHOQOL-Bref) questionnaire, validated and adapted to Brazil was used²¹. This questionnaire was developed using a cross-cultural approach with specific domains and general questions that cross differences at the level of industrialization, availability of health services, importance of family and prevalent religion, among others. Four domains were evaluated by the instrument: physical, psychological, social relations and environment; in addition to two general questions: one about the perception of one's own quality of life, and another about the satisfaction with one's own health. Each domain and its respective characteristics show objective and subjective aspects for the evaluation, and the answers are given on a five-point Likert scale²¹.

Data Storage and Analysis

The data were stored and processed using the software Statistical Package for the Social Sciences, version 20.0 (SPSS 20.0). The statistical analysis estimated the 95% CI and a p-value <0.05.

Quality of life assessment was performed according to WHO recommendations, recoding the variables so that, in the 5-point Likert scale, a value equal to 1 represents the worst response and a value of 5 the best response, regarding each characteristic; in addition to computing each characteristic in its respective domain²¹. Thus, it was possible to classify the quality of life in each assessed domain and in the two general questions according to the following score: needs improvement (1 to 2.9), regular (3 to 3.9), good (4 to 4.9) and very good (5). In addition, the quality of life was assessed by calculating the scores of each domain separately. The gross score was transformed on a scale from 0 to 100 (ET 0-100 transformed score) according to syntax for SPSS, as proposed by the WHO²¹. Thus, the minimum score for each domain is zero and the maximum is 100, and the higher the score, the more positive is the assessment of the domain²¹.

Data analysis was performed using descriptive statistics to characterize the sample, including measures of central tendency, measures of dispersion and absolute and relative frequencies. Then, a bivariate analysis was performed using a test for comparison of mean scores (Student's *t* test, when the comparison was made between two groups; ANOVA; when the comparison was made with more than two groups), aiming to identify possible variables associated with the investigated domains.

Finally, a multivariate analysis using binary logistic regression was performed to adjust for possible confounding variables and to identify possible factors associated with poor quality of life in the investigated domains. Therefore, the quality

of life domains were dichotomized into the classification: "good/very good", "regular/needs improvement". For the regression model, the variables were grouped into the following blocks: 1) sociodemographic variables (gender, class and religion); 2) health variables (BMI, WHR, alcohol consumption, tobacco consumption); 3) self-assessment variables (perception of quality of life and satisfaction with one's own health). Sociodemographic variables were included in the binary logistic regression, regardless of the p-value in the bivariate analysis, given their importance for adjusting the analysis. The other variables were selected according to the statistical significance obtained in the bivariate analysis, considering as inclusion criteria a p-value <0.20.

Ethical Procedures

The study was approved by the Research Ethics Committee of the FACISA/UFRN, as determined by Resolution 466/12 of the National Health Council (CNS), which defines the guidelines and regulatory standards that regulate research involving human beings, under Protocol N. 2,452,346.

RESULTS

In total, 145 individuals agreed to participate in this study. The response rate was 90.6%, out of a total eligible population of 160 individuals. The mean age of the sample was 22.87 ± 4.03 years (minimum age of 18 and maximum of 46 years). Table 1 characterizes the sample according to sociodemographic variables, anthropometric measurements and lifestyle habits. Most students declared themselves as male (55.2%), of brown ethnicity (51.4%), single (93.8%) and not performing paid work (91.7%); only 19.3% declared to be scholarship holders. Regarding the anthropometric measurements, 64.1% had normal weight and 9.1% moderate/high cardiovascular risk, according to the classification of body mass index and waist/hip ratio, respectively. Regarding lifestyle habits, 58.6% said they practiced some religion, 55.2% consumed alcohol, 5.6% smoked, and 73.6% regularly practiced some type of physical activity.

Table 2 characterizes the sample according to the quality of life classification in each domain and assessed characteristics. It was observed that the 'perception of quality of life' and 'satisfaction with one's own health' characteristics had a positive evaluation, being considered good/very good by 75.8% and 58.6% of students, respectively. Regarding the four domains: physical, psychological, social relations and environmental, the best rated domain was 'social relations', which had a good/very good rating by 55.6% of students, followed by the physical and psychological domains, with 35.7% and 35% positive ratings (good or very good ratings). The worst rated domain

was 'environment', which was rated "good" by only 26.4% of the students. These same results are also verified through the score of each domain (Table 3).

The evaluation of the scores of each domain was calculated to compare the means with possible association variables. Thus, a lower score in the 'physical' domain was associated with the female gender ($p = 0.01$), smoking ($p = 0.03$), negative perception

of one's quality of life ($p < 0.001$) and a negative satisfaction with their own health ($p < 0.001$) (Table 3). In this same sense, were associated with a lower score in the 'psychological' domain the female gender ($p = 0.01$), not practicing any religion ($p = 0.02$), smoking ($p < 0.01$), a negative perception of one's quality of life ($p < 0.001$) and a negative satisfaction with one's own health ($p < 0.001$) (Table 3). In relation to 'social

Table 1. Characterization of the sample according to sociodemographic variables, anthropometric measurements, and lifestyle habits, Caicó-RN, 2018.

Sociodemographic Variables		Absolute Frequency (n)	Absolute Frequency (%)
GENDER	Male	80	55.2%
	Female	65	44.8%
MARITAL STATUS	Single	136	93.8%
	Married/Common-law marriage	8	5.5%
	Separated/divorced	1	0.7%
SKIN COLOR/ETHNICITY	White	63	44.4%
	Black	6	4.2%
	Brown	73	51.4%
MEDICAL SCHOOL YEAR	4th year	29	20%
	3rd year	38	26.2%
	2nd year	39	26.9%
	1st year	39	26.9%
PAID WORK	No	133	91.7%
	Yes	12	8.3%
ACADEMIC SCHOLARSHIP	No	117	80.7%
	Yes	28	19.3%
Anthropometric measurements			
WHR	Low risk	130	90.9%
	Moderate risk	7	4.9%
	High risk	6	4.2%
BMI	Low weight	7	4.9%
	Normal weight	91	64.1%
	Overweight	34	23.9%
	Obesity	10	7%
Lifestyle habits			
RELIGIOUS PRACTICE	No	58	41.4%
	Yes	82	58.6%
ALCOHOL CONSUMPTION	No	65	44.8%
	Yes	80	55.2%
SMOKER	No	136	94.4%
	Yes	8	5.6%
PRACTICES PHYSICAL ACTIVITY	No	38	26.4%
	Yes	106	73.6%

Table 2. Sample characterization according to WHOQOL-Bref, Caicó-RN, 2018.

WHOQOL-Bref		Absolute Frequency (n)	Relative Frequency (%)
QUALITY OF LIFE PERCEPTION	Needs improvement	11	7.6%
	Regular	24	16.6%
	Good	93	64.1%
	Very good	17	11.7%
HEALTH SATISFACTION	Needs improvement	27	18.6%
	Regular	33	22.8%
	Good	66	45.5%
	Very good	19	13.1%
PHYSICAL DOMAIN	Needs improvement	14	9.8%
	Regular	78	54.5%
	Good	51	35.7%
	Very good	0	0%
PSYCHOLOGICAL DOMAIN	Needs improvement	20	14%
	Regular	73	51%
	Good	49	34.3%
	Very good	1	0.7%
SOCIAL RELATIONSHIPS	Needs improvement	16	11.3%
	Regular	47	33.1%
	Good	70	49.3%
	Very good	9	6.3%
ENVIRONMENTAL	Needs improvement	15	10.4%
	Regular	91	63.2%
	Good	38	26.4%
	Very good	0	0

relations', the following were associated with a lower score in this domain: not practicing any religion ($p = 0.03$), smoking ($p = 0.01$), a negative perception of quality of life ($p < 0.01$) (Table 3). And a lower score in the 'environmental' domain, was associated to smoking ($p < 0.001$), a negative perception of one's quality of life ($p < 0.01$) and a negative satisfaction with one's own health ($p < 0.001$) (Table 3).

Table 4 shows the binary logistic regression models developed to evaluate the factors associated with the poor quality of life of medical students in each investigated domain. For the physical domain, the factors associated with quality of

life were female gender and negative satisfaction with their own health, so that women had a chance ratio of around 3.05 [1.24 - 7.52] of having a poor quality of life in relation to men, after adjusting for the covariates; and having a negative satisfaction with one's health represents a 7.99 [2.81- 22.67] chance of having a poor quality of life.

For the psychological domain, the factors associated with poor quality of life were the fact that they were attending the preclinical years (1st and 2nd years) with a chance ratio of 5.01 [1.95 - 12.87] in relation to the clinical years (3rd and 4th years); as well as having a low perception of quality of life and satisfaction

Table 3. Comparison analysis of WHOQOL-Bref domains score, Caicó-RN, 2018.

VARIABLES		PHYSICAL DOMAIN		PSYCHOLOGICAL DOMAIN		SOCIAL RELATIONSHIPS		ENVIRONMENTAL DOMAIN	
		TOTAL SCORE 67.09 ± 16.06 [Min.: 21.43; Max.: 96.43]		TOTAL SCORE 65.40 ± 16.90 [Min.: 8.33; Max.: 100.00]		TOTAL SCORE 70.25 ± 18.54 [Min.: 16.67; Max.: 100.00]		TOTAL SCORE 64.64 ± 13.36 [Min.: 21.80; Max.: 96.80]	
		MEAN	p-value	MEAN	p-value	MEAN	p-value	MEAN	p-value
SEX	Male	70.09	0.012	68.03	0.038	69.32	0.502	65.70	0.291
	Female	63.39		62.17		71.41		63.33	
YEAR AT MEDICAL SCHOOL	1st year	66.68	0.158	65.38	0.139	70.72	0.08	65.17	0.570
	2nd year	65.29		63.88		67.09		62.98	
	3rd year	64.84		62.28		67.43		63.73	
	4th year	73.01		71.58		77.58		67.34	
ACADEMIC SCHOLARSHIP	Yes	69.00	0.485	64.88	0.855	67.70	0.420	64.06	0.799
	No	66.63		65.53		70.86		64.78	
RELIGIOUS PRACTICE	Yes	68.51	0.271	68.09	0.022	73.11	0.034	66.36	0.093
	No	65.51		61.42		66.37		62.60	
PHYSICAL ACTIVITY	Yes	68.12	0.306	65.72	0.653	69.53	0.498	64.87	0.727
	No	65.03		64.27		71.92		63.98	
BMI	Low weight	66.32	0.421	69.04	0.031	70.23	0.181	67.41	0.262
	Normal weight	66.00		63.14*		68.40		63.57	
	Overweight/Obesity	69.89		70.85*		74.71		67.40	
WHR	Low risk	67.82	0.162	66.25	0.290	70.28	0.939	65.15	0.354
	Moderate/high risk	61.26		61.21		69.87		61.53	
ALCOHOL CONSUMPTION	Yes	67.85	0.527	67.04	0.198	70.93	0.627	65.82	0.241
	No	66.15		63.39		69.42		63.19	
SMOKER	Yes	55.35	0.034	47.39	0.002	55.20	0.019	48.82	<0.001
	No	67.77		66.42		71.04		65.58	
QUALITY OF LIFE PERCEPTION	Good/very good	70.45	<0.001	70.45	<0.001	72.68	0.005	68.27	<0.001
	Regular/needs improvement	56.53		56.53		62.61		53.21	
HEALTH SATISFACTION	Good/very good	74.11	<0.001	74.11	<0.001	72.10	0.154	68.25	<0.001
	Regular/needs improvement	57.15		57.15		67.63		59.53	

* Statistical difference found between the categories of normal weight – overweight/obesity *Post-hoc* Tukey ($p = 0.027$)

with one's own health. However, having a non-normal BMI (underweight and overweight/obesity) was shown to be a protective factor for poor quality of life in the psychological domain, with a chance ratio of 0.30 [0.10 - 0.85] when compared to a normal BMI, even after covariate adjustments.

Regarding the social relations and environmental domains, the negative perception of their own quality of life was the only factor that remained associated with poor quality of life in these domains, after adjusting for other sociodemographic variables and health conditions.

DISCUSSION

The present study characterized the quality of life of EMCM medical students and identified the following as the main factors associated with poor quality of life: female gender, attending the preclinical years (1st and 2nd years), having a negative evaluation of their own health and quality of life. The results also showed that most students had a negative evaluation of their physical, psychological and environmental domains; in contrast to the social relationships domain, for which most reported a positive assessment.

Table 4. Binary logistic regression models to assess factors associated with medical students life quality, Caicó-RN, 2018.

Variables	Physical Domain		Psychological Domain		Social Relationships Domain		Environmental Domain	
	Odds Ratio [IC95%]	p-value	Odds Ratio [IC95%]	p-value	Odds Ratio [IC95%]	p-value	Odds Ratio [IC95%]	p-value
Block 1: Sociodemographic Variables								
<i>Gender</i>								
Male	1.00	0.01	1.00	0.10	1.00	0.39	1.00	0.40
Female	3.05 [1.24 - 7.52]		2.21 [0.85 - 5.73]		0.70 [0.31 - 1.57]		1.42 [0.61 - 3.28]	
<i>Medical School Period</i>								
Clinical Period	1.00	0.29	1.00	<0.01	1.00	0.05	1.00	0.33
Preclinical Period	1.55 [0.68 - 3.52]		5.01 [1.95 - 12.87]		2.10 [0.99 - 4.46]		1.48 [0.66 - 3.32]	
<i>Religious practice</i>								
Yes	1.00	0.59	1.00	0.60	1.00	0.88	1.00	0.46
No	0.79 [0.33 - 1.85]		1.28 [0.50 - 3.29]		1.05 [0.49 - 2.28]		1.36 [0.59 - 3.17]	
Block 2: Health Variables								
<i>BMI</i>								
Normal Weight	#		1.00	0.02	1.00	0.06	#	
Low Weight/ Overweight/Obesity	#		0.30 [0.10 - 0.85]		0.45 [0.20 - 1.04]		#	
<i>WHR</i>								
Low Risk	1.00	0.65	#		#		#	
Moderate/high risk	0.65 [0.10 - 4.20]		#		#			
<i>Alcohol consumption</i>								
No	#		1.00	0.55	#		#	
Yes	#		0.75 [0.30 - 1.89]		#			
<i>Smoker</i>								
No	1.00	0.34	1.00	0.47	0.34 [0.05 - 2.02]	0.23	##	
Yes	0.30 [0.02 - 3.58]		2.63 [0.18 - 37.85]		##			
Block 3: General QoL Variables								
<i>Quality of Life Perception</i>								
Good/very good	1.00	0.81	1.00	<0.01	1.00	0.01	1.00	0.03
Regular/ Needs improvement	1.15 [0.34 - 3.88]		10.45 [1.91 - 57.10]		3.70 [1.36 - 10.07]		5.30 [1.12 - 25.15]	
<i>Satisfaction with one's health</i>								
Good/very good	1.00	<0.01	1.00	<0.01	1.00	0.36	1.00	0.08
Regular/Needs improvement	7.99 [2.81 - 22.67]		5.77 [1.98 - 16.83]		0.67 [0.28 - 1.57]		2.27 [0.89 - 5.79]	

#The variables did not enter the model because they showed a p-value>0.20 in the bivariate analysis in relation to the investigated domain.

The variable entered the regression mode, however, the value could not be computed since 100% of those who smoke showed a regular/needs improvement quality of life for the environmental domain, making comparative analysis impossible.

The environmental domain (ED) was predominantly evaluated as “regular/needs improvement”. This domain encompasses the ability to enjoy moments of leisure and relaxation, the availability of transportation and ease to get around, as well as aspects of physical safety and financial resources^{21,22}. In a comparative study with American medical students, Brazilians had worse quality of life in the environmental domain. As in EMCM, Americans are exposed to smaller classrooms, PBL, subjects integrated by organ system, early exposure to patients and have psychological support. On the other hand, they are located in the capital of a more developed country²³.

An Australian study has shown the effect that the host city infrastructure has in the choice and permanence of medical students in Rural Clinical Schools in contrast to metropolitan centers²⁴. Thus, this result can be explained by the context in which the EMCM is inserted – a city in northeast Brazil countryside, characterized by hot and dry climate, lacking infrastructure in the service sector and scarce leisure options. In the bivariate analysis, a poor quality of life in the ED was associated with smoking, negative perception of one’s quality of life and negative satisfaction with one’s own health^{5,25-29}. However, in the multivariate analysis, only the negative perception of quality of life remained as a factor associated with ED; also, it is possible to consider an association between smoking and poor quality of life in ED, since 100% of those who smoked had a regular quality of life/needs improvement rating for ED.

Regarding the physical domain (PhD), the female gender showed to be an important factor associated with worse scores, corroborating the results of other studies in which women in medical school were more likely to develop common mental disorders, higher empathic concern and personal distress disposition³⁰. A study in northeast Brazil, with a similar population sample, identified 70.3% of female students with anxiety and depression⁷, which could be directly related to social stigma, gender inequality, hormonal differences, personality traits, conflicting roles and educational environment^{6,31-36}. Furthermore, recently, a study in Mexico concluded that lower psychological well-being compromises the learning process, quality of life and future professional practice in female medical students³⁴. In the present study, after the multivariate analysis, a negative satisfaction with one’s own health remained a predictors of poor quality of life in the physical domain.

The psychological domain (PsD) was the second worst domain evaluated in this study, corroborating other findings, which indicate that medical students, compared to the overall population, have a higher prevalence of common mental disorders, episodes of major depression, sleep

disorders and greater use of medication after the beginning of medical school^{4,35,37}.

It is noteworthy that these signs start during the undergraduate years and perpetuate themselves throughout professional life²⁵. In Brazil, for example, over 50% of medical professionals have some type of psychiatric disorder, such as anxiety, depression and burnout syndrome, and 5% of physicians feel unhappy, hopeless, and have suicidal ideations⁶. In this case, previous studies have evaluated the quality of life of medical students in large urban centers^{4-6,10,25,26,31,32}, but without reaching a consensus on the associated factors. In the multivariate analysis, after adjusting for confounding variables, a negative evaluation of their own health and quality of life, and the fact of attending the preclinical years (1st and 2nd) remained as factors associated with poor quality of life for the PsD, in contrast to other studies that reveal a worse quality of life in more advanced school years^{5-6,10,25-26,28,37}. A BMI classified as low weight/overweight/obesity was evidenced as a protective factor for quality of life in PsD, which can be explained by the fact that, in order to escape from stress, students have physical activity practice as their main entertainment in the city, present in more than half of the population of this study; and meetings in bars and restaurants, which stimulate the consumption of alcohol and regional food.

Also, it is important to consider that upon entering medical school, students need to adapt to a new reality, with changes in lifestyle and the acquisition of greater responsibilities, for which they may not yet be prepared^{6,29}. Contrasts in the teaching-learning process, curricular structure, regional and methodological differences must be used⁷. In addition, corroborating the present findings, studies show that active methodologies such as PBL can cause adaptation difficulties due to student immaturity^{28,39,40}. Nevertheless, with the course progress and knowledge of the method, PBL favors experiences that enable solutions to their problems in the course, as well as the relief of the students’ subjective suffering^{25,28,39,41}.

Literature shows that medical students with higher levels of resilience had better quality of life and better perception of the educational environment⁴², and one of the strongest strategies to stimulate resilience among students is to intensify interpersonal relationships^{4,10,32,36,43-44}. These data were present in our study, showing that ‘social relations’ have a good/very good rating for 55.6% of students, which is the domain with the best score. In alignment with another studies, it was noticed that medical school, being a full-time course, favors students’ strengthening ties with each other, developing similar activities, as well as sharing experiences and responsibilities surrounded by a greater emotional burden or tension^{7,37}. Associated to this, the interaction between students in small groups and the

student-professor approach in active methodologies make the construction of knowledge and social ties more effective, as well as providing strategies to alleviate the main difficulties encountered at the beginning of the medical course.

Compared to large capital cities, medical students in rural areas experience less depression and, when there is anxiety, it occurs at lower or moderate levels⁴⁵. Difficulties, represented here by low quality of life, are understood by students as necessary and inherent in the process of becoming a doctor but, undoubtedly, lower rates of violence, a lower cost of living and less traffic are positive aspects of rural areas⁸. In addition, many rural doctors are attracted by the lifestyle of the rural environment, which is associated with a better quality of life with the family, and a good place to raise children, away from the difficulties found in big cities, together with the pleasures of outdoor living⁴⁶. By promoting transformative educational approaches in these places, we will certainly form competent and humanistic professionals⁴⁷.

This study was conducted with technical-scientific rigor, and it is understood that the fact that this work was performed with a small local population sample restricts broader conclusions regarding the quality of life of medical students. In addition, the cross-sectional aspect of the study limits information about the evolution of this quality of life over the course. Therefore, it is suggested that longitudinal studies continue to expand the potential of data analysis and also comparative studies with other populations.

CONCLUSION

This study characterized the quality of life of medical students, being important in contextualizing the interiorization of medical education in Brazil, and the teaching based on Problem-Based Learning. In addition, the findings provide a better understanding of the factors that negatively or positively impact the life of the individual, specifically medical students.

It was observed that those who negatively evaluate their own health have worse quality of life. The results also showed that the majority of students positively evaluated the social relations domain, while the physical, psychological and environmental domains were negatively rated. The most important findings were that male gender, attending the clinical periods (3rd and 4th years of the course), and not being a smoker were associated with a better assessment of their own quality of life, especially in the physical, psychological and environmental domains, respectively. Unexpectedly, normal weight classified by the body mass index was correlated with a worse assessment of quality of life in the psychological domain.

AUTHORS' CONTRIBUTION

Heloisa Alves dos Santos, Jair Matos Segundo, Maria Luiza Lins Barreto and Victor Régis dos Santos: Study conception and design; acquisition of data; drafting of the manuscript. George Dantas de Azevedo: Study conception and design; critical revision. Ana Carolina Patrício de Albuquerque Sousa: Study conception and design; acquisition of data; analysis and interpretation of data; drafting of the manuscript; critical revision.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

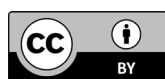
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