

Life style and quality of sleep in medical students of a public university, during the COVID-19 pandemic: a cross-sectional study

Estilo de vida e qualidade do sono de estudantes de medicina em uma universidade pública, durante a pandemia da COVID-19: um estudo transversal

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Martins JMS, Ferreira EAL, Valet COS. Estilo de vida e qualidade do sono de estudantes de medicina em uma universidade pública, durante a pandemia da COVID-19: um estudo transversal / Life style and quality of sleep in medical students of a public university, during the COVID-19 pandemic: a cross-sectional study. Rev Med (São Paulo). 2022 March-April;101(2):e-193941.

ABSTRACT: *Introduction:* The academic life of medical students may compromise sleep quality and quality of life. *Objective:* To evaluate lifestyle and sleep quality in medical students. *Methods:* This is an online cross-sectional survey study. Two hundred attending medical students of a public university in São Paulo were invited to participate and 61(30.5%) answered the questionnaire. Sampling occurred during the COVID-19, between November 2020 and March 2021. Exclusion criteria was incorrect filling of the questionnaire. The Pittsburg Sleep Quality Index (PSQI) and the Fantastic Life Questionnaire (FLQ) were applied. Differences between more than two medians were calculated by Kruskal-Wallis ANOVA. The association between life style and sleep quality was calculated by Spearman correlation. A p value <0.05 was considered. *Results:* PSQI median was 6 (poor) and FLQ was 55 (good). As life style worsened, sleep quality also worsened (p=0.005). A correlation between a worse life style and a worse sleep quality was observed (p<0.001). *Conclusion:* It was observed that most medical students had a good or regular life style and a poor sleep quality. As long as sleep quality worsened, life style worsened. This study was conducted during the COVID-19 pandemic and its results may have been influenced by this.

Keywords: Lifestyle; Sleep; Students, medical.

RESUMO: *Introdução:* A graduação em medicina pode comprometer a qualidade do sono e a qualidade de vida. *Objetivo:* Avaliar o estilo de vida e a qualidade do sono entre estudantes de medicina. *Métodos:* Trata-se de estudo do tipo *survey online* transversal. Foram convidados os 200 estudantes de medicina de uma universidade pública de São Paulo, que cursavam regularmente, dos quais 61 (30,5%) responderam ao questionário. A coleta foi realizada durante a pandemia da COVID-19, no período de novembro de 2020 a março de 2021. O critério de exclusão foi o preenchimento incorreto do questionário. Foram aplicados o Índice de Qualidade do Sono de Pittsburg (PSQI) e a *Fantastic Life Questionnaire* (FLQ). Diferenças entre mais de duas medianas foram calculadas pela ANOVA de *Kruskal-Wallis*. A associação entre o estilo de vida e a qualidade do sono foi calculada pela correlação de *Spearman*. Foi considerado o valor de p<0,05. *Resultados:* A mediana do PSQI foi 6 (ruim) e do FLQ foi 55 (bom). A medida em que o estilo de vida piorou, a qualidade do sono piorou (p=0,005). Foi observada correlação entre a piora do estilo de vida e a piora da qualidade do sono (p<0.001). *Conclusão:* Foi observado que a maioria dos estudantes desta universidade apresentavam estilo de vida bom ou regular, qualidade do sono ruim e à medida que a qualidade do sono piorou a qualidade de vida também piorou. Este estudo foi conduzido durante a pandemia da COVID-19 e seus resultados podem ter sido influenciados por isto.

Palavras-chave: Estilo de vida; Sono; Estudantes de medicina.

This research is part of the scientific research project of the student João Mateus Silva Martins, who was oriented by Professor Esther Angelica Luiz Ferreira and co-oriented by Professor Cristina Ortiz Sobrinho Valet. Institution where the study was carried out: Medicine Department, Federal University of São Carlos.

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INTRODUCTION

Health is a concept that encompasses physical, mental and social well-being and not just the absence of illnesses¹. In this context, health is not exclusively determined by aspects related to individual physical health, but also, by aspects related to the psychological status, personal beliefs, and the involvement with environment essential characteristics¹.

Medical graduation intends diligences to develop physicians well trained, responsible, able to promote health and offer care for patients. The uninterrupted effort, necessary to be a physician can, in some cases, result in physical and psychological distress during graduation or even after. Some conditions, such as the exhausting timetable, sleep deprivation, the exposure to human suffering, financial issues and bad relationship between students have been related in some studies, to contribute to physical and psychological distress among medical students²⁻⁶.

Furthermore, there are some evidences that medical students' lifestyle is not good to their health, because some behaviors, such as alcohol, tobacco and other drugs abuse, unprotected sexual practices, sleep deprivation, unhealthy food habits and poor physical activity are also related in these students⁷⁻⁹.

Some studies also indicate a remarkable incidence of sleep disorders among graduation' students, and medical students, and this scenario is even more worrisome. A descriptive cross-sectional study that involved 372 students revealed that 39.5% reported a bad or very bad sleep quality, 29.5% reported a sleep delay of more than 30 minutes, and 36.9% had difficulty in being awake during the day, at least once a week¹⁰.

It is known that sleep disorders are related to an increase in psychiatric disorders' incidence and the emergence and escalation of health problems. Thus, sleep quality is an essential information to a person's global health evaluation¹¹.

Considering this scenario, this study aimed to evaluate lifestyle and sleep quality of medical students in a public university in São Paulo.

METHODS

Study design

This is a survey study, cross-sectional, online, carried out at São Carlos Federal University. This study was approved by the Ethics in Research Committee, on July 12th, 2020 (CAAE 31527020.3.0000.5504). All participants agreed with the informed consent disclosure.

Study population

Study population was represented by medical students who answered the survey between November

2020 and March 2021. During this period, all curricular activities were online. Only the fifth and sixth graduation years were on a hybrid model.

The inclusion criteria were being a medical student from the first to the sixth year, registered in the medical graduation course at São Carlos Federal University, with an age above 18 years, with a regular participation in the graduation activities. Exclusion criteria was the incorrect survey filling.

Data sources

Medical students were invited to participate in the study through an inviting-letter sent by digital media (e-mail, WhatsApp, and Facebook). The answers were registered in a software for research management, with safety resources, such as the impossibility to identify students directly from the forms, restricted access by e-mail and password. Data were later exported to an Excel sheet.

The applied form had three sections: a social and financial form (with 17 questions), the "Fantastic Lifestyle Questionnaire" (FLQ)¹² and the Pittsburgh Sleep Quality Index (PSQI)¹³. In the social and financial form, were collected information about sex, age, marital status, job, level of education, social information and spirituality. The Brazilian version of FLQ was used to quantify students' lifestyle. This is composed by 25 questions, splitted in 9 domains: family and friends, physical activity, nutrition, drugs and tobacco, alcohol, sleep, stress and safe sex, behavior, introspection. This questionnaire is validated for Brazilian young adults¹² and the higher the punctuation, the better quality of life is. Sleep quality was evaluated by the PSQI. This questionnaire is composed by 19 items and evaluates seven components of sleep quality. It has a global score that varies from 0 to 21. Scores above 5, point to a bad sleep quality, and scores above 10 points to an impending sleep disorder. The higher the punctuation, the worse sleep quality is.

This study followed the recommendations of CROSS checklist for survey studies¹⁴.

Statistical analysis

Stata version 13.0 (*Stata Corp*, LC) was used for statistical analysis. At first, a descriptive analysis was made. Results are presented as frequencies and percents, medians and interquartile range (IQR). To compare differences between PSQI medians and lifestyle, *Kruskal-Wallis* ANOVA was applied. To evaluate the association between lifestyle and sleep quality, *Spearman* correlation was calculated. A statistical significance of $p < 0.05$ was considered.

RESULTS

Among the 200 students, spread over the six years

of medical course, 62 (31%) answered the survey. One student was excluded for incorrect survey filling. Study population was composed by 61 students. Table 1 shows the characteristics of the sample.

Table 1. Characteristics of 61 medical students who participated in the study

CHARACTERISTIC	n	%
What is your sex designated at birth?		
Female	33	54.1
Male	28	45.9
What is your marital status?		
Single	54	88.5
Others	7	11.5
What is your skin color?		
White	35	57.4
Brownish	20	32.8
Black	3	4.9
Indigenous	2	3.2
Yellow	1	1.6
What is your religion? (Spirituality)		
None	25	41.0
Catholic	20	32.8
Evangelic	6	9.8
Spiritist	5	8.2
Others	5	8.2
Who do you live with?		
Family members	33	54.1
Alone	20	32.8
Students' republic	8	13.1
How many books did you read last year?		
None	4	6.5
Less than 3	22	36.1
Between 3 and 5	12	19.6
Between 5 and 8	7	11.4
More than 8	16	26.2
Water used in your residence comes from where?		
Water network	60	98.3
Artesian well	1	1.6
Your street is:		
Paved	59	96.7
Soil	2	3.2
Are you doing a mental therapy?		
No	39	63.9
Yes	22	36.0

FLQ median was 55 (IQR 49-61) and PSQI was 6 (IQR 5-8). Table 2 shows the punctuation, that pointed to most of students (65.5%) with good or regular lifestyle and regarding sleep, most of students reported a bad sleep quality.

Table 2. Lifestyle and sleep quality in medical students

Classification	Punctuation	n	%
Lifestyle			
Excellent	85 to 100	0	0
Very good	70 to 84	1	1.6
Good	55 to 69	34	55.7
Regular	35 to 54	24	39.3
Needs to improve	0 to 34	2	3.2
Global sleep quality			
Good	0 to 5	15	24.6
Bad	6 to 10	40	65.6
Sleep disorder	≥11	6	9.4

The analysis of PSQI components revealed that 55.7% of students reported a good subjective sleep quality. A good latency, sleep duration and efficiency were observed and use of medications to sleep at least once a week was reported in 18%. Nonetheless, mild to moderate dysfunction was reported in 75.3% (Table 3).

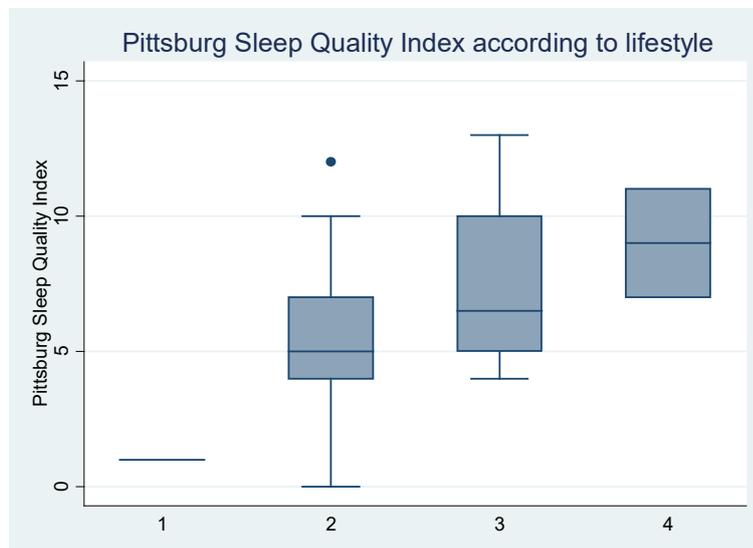
Table 3. Main results of PSQI components

PSQI	n	%
Subjective sleep quality		
Very good	10	16.4
Good	34	55.7
Bad	16	26.2
Very bad	1	1.7
Sleep latency		
<15 min	23	37.7
16 to 30 min	24	39.3
31 to 60 min	11	18.0
60 min	3	5.0
Sleep duration		
>7 hours	22	36,0
6 to 7 hours	14	23,0
5 to 6 hours	11	18,0
< 5 hours	14	23,0
Sleep efficiency		
>85%	39	63.9
75 to 84%	7	11.5
65 to 74%	1	1.7
<65%	14	22.9
Use of medications to seep		
Never	50	82.0
Less than once a week	4	6.5
Once or twice a week	2	3.3
More than three times a week	5	8.2
Dysfunction during the day		
None	6	9.8
Mild	22	36.0
Moderate	24	39.3
Severe	9	14.9

Graph 1 shows the observed relation between sleep quality and lifestyle (1=very good, 2=good, 3=regular, 4=needs to improve) and it was observed a difference

of medians ($p=0.005$). Lifestyle and sleep quality were inversely correlated ($Spearman = -0.5397$; $p<0.001$).

Graph 1. Sleep quality according to Lifestyle in medical students



Kruskal Wallis ANOVA $p=0.005$; Lifestyle: 1=very good, 2=good, 3=regular, 4=needs to improve.

DISCUSSION

In this study, we observed among medical students in a public university, that most of them were classified as having a good or regular lifestyle, sleep quality was bad and as lifestyle worsened, sleep quality worsened too. We emphasize that these results should be interpreted with caution, as data were obtained during COVID-19 pandemic.

In FLQ evaluation, 55.73% of students self-reported as good quality of life and 39.34%, as regular. FLQ median was 55 points (good). Graduation students' lifestyle, especially medical students, has been object of interest for research, because inappropriate lifestyle has been reported¹⁵. This result, even though worrisome, was better than the one reported by Tassini et al.¹⁶, who observed in 57 students, that 47 had a lifestyle regular or needing improvement. The authors observed a mean FLQ of 48.1. It is worth mentioning that the reported study included medical and physiotherapy students in a private university, different from the present study.

Regarding PSQI, it was observed a median of 6 (bad). This result is in agreement with two other studies that observed values from 7.2 to 6.99^{17,18}. Besides, the results of the present study reveal that in 65.57%, sleep quality was bad, and this needs to improve. This result is in agreement with Perotta's study¹⁹, that reported 62.2% of students with a bad sleep quality and a mean PSQI of 6.7. On the other hand, Correa et al.¹⁰ observed 39.5% of bad or very bad sleep quality, in a study with more participants, in the city

of Botucatu. Silva et al.²⁰ identified in 2018, excessive daily somnolence and 47.6% of bad sleep quality in the global PSQI analysis. It is important to highlight that in the present study, data was collected during the COVID-19 pandemic, and it is possible that sleep problems were more prevalent in the overall population, as observed by Souza et al.²¹. The authors evaluated these disorders during the COVID-19 pandemic, in a systematic review study.

The analysis of sleep components indicated that disfunction was frequent during the day, from mild to moderate. On the other hand, most of students reported a good sleep efficiency, lasting for six hours or longer and latency of ≤ 15 min. Furthermore, subjective evaluation of sleep quality was good in 55.7%. The use of medications to sleep at least once a week occurred in 18% and we considered this a high frequency, in comparison to Corrêa et al.¹⁰, who found 8.6%. These results are similar to those observed by Silva et al.²⁰, who reported a 21% frequency of use of these medications. Different from the present study, the authors did not investigate lifestyle, but they evaluated the Epworth Somnolence Scale²², and they observed excessive somnolence.

We observed that sleep quality worsened as lifestyle tended to "needs to improve". Thus, it is reasonable to affirm that lifestyle and sleep quality in medical students are interrelated. Perotta¹⁹ in 2018, in a study that also included medical students, observed that daytime sleepiness was associated with a worse quality of life. It must be reinforced that quality of life was evaluated by other scale, the VERAS-Q (a questionnaire to evaluate quality of life

of students in health professions)¹⁹, different from the present study. In a cross-sectional study to evaluate factors associated to quality of life of medical students in Brazil, Miguel et al.²³ applied different sleep scales, resilience, anxiety, empathy and burnout. The authors reported difference of quality of life for students, considering the PSQI a dichotomous variable (≤ 6 or more)²³. In another study with secondary level students it was reported that non-restorative sleep was associated with a worse quality of life, suggesting that even at lower teaching levels, sleep and quality of life are associated²⁴.

The results of the present study should be interpreted with caution, as this was carried during the COVID-19 pandemic. It is possible that results have been over estimated, as a result of this particularity. Kobbaz et al.²⁵, in a cross-sectional study, reported that COVID-19 pandemic caused no impact on sleep quality as 34.5% of students reported a worsening and 36% reported an improvement. Francesco et al.²⁶, in Italy, compared students' behavior before, after the pandemic and during the lockdown and they observed a reduction on physical activity, tending to inactivity, suggesting that this would reflect a change in lifestyle. In Greece, a cross-sectional

study included seven medical schools and it was observed during the pandemic, 65.9% of sleeplessness, 52.4% of low quality of sleep, anxiety symptoms and depression among medical students²⁷. These studies also require a carefully interpretation, especially regarding cultural differences among the countries.

This study has limitations. The small sample size, the data collected during the COVID-19 pandemic and in a single university impairs its results inference. These particularities reinforce the need to continue this study in a post-pandemic period.

FINAL CONSIDERATIONS

We concluded that, in the group of students evaluated, a few more than a half of them reported a good lifestyle and most of them reported a bad sleep quality. It was observed an association between lifestyle and sleep quality. Measures to improve health are required in this population, aiming to increase sleep hygiene and quality of life. However, this study was carried out during the COVID-19 pandemic and its results may have been influenced by this.

Financial support: This study was produced with personal resources.

Conflict of interest disclosure: None.

Acknowledgements: The authors thank for all students who participated in this study.

Authorship: The authors undertake the authorship of the manuscript.

Contributions: *Martins JMS* - participated in the conception, data collection, discussed the results, writing, final revision and article edition. *Ferreira EAL* - participated in the conception, data collection, discussed the results, writing, final revision, article edition and submission. *Valete COS* - participated in data analysis, discussed the results, writing, final revision and article edition.

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Submitted: 2022, January 01

Accepted: 2022, February 22