

Fantastic Lifestyle Questionnaire applied to undergraduate medical students during the COVID-19 pandemic: a factor analysis

João Mateus Silva Martins¹ , Esther Angélica Luiz Ferreira^{1*} , Cristina Ortiz Sobrinho Valet¹ ,
Hendrick Henrique Fernandes Gramasco² 

SUMMARY

OBJECTIVE: To identify what structure represents life style in medical students, in a public university, with the application of the Fantastic Lifestyle Questionnaire.

METHODS: This is a cross-sectional exploratory study. The Fantastic Lifestyle Questionnaire was applied online to medical students. Factorial analysis was realized and factors were extracted by principal components method. Rotation was conducted by Varimax method.

RESULTS: Sixty-one questionnaires were analyzed. Students were male in 45.9%, single in 88.5%. The model was composed of three factors that explained 63.5% of all observed variance. The factors related to sleep perception, nutrition and stress, followed by relationships and entertainment and then, activity. Cronbach's alpha was 0.81, which was considered good.

CONCLUSION: The model composed by the three factors observed in this group of students represented the construct quality of life, evaluated by the Fantastic Lifestyle Questionnaire. This result may provide substrate to actions that aim to improve quality of life and well-being in medical students from this university.

KEYWORDS: Factor analysis. Medical students. Lifestyle. Quality of life. COVID-19.

INTRODUCTION

Health is a global concept that encompasses physical, mental and social well-being and not just the absence of illnesses¹. In this context, medical students may have their health compromised due to a set of specificities, such as a tiring schedule, lack of sleep, exposure to human suffering, financial issues, and even the poor relationship between students. These situations can result in physical and psychological suffering^{2,3}.

The set of habits and behaviors in response to everyday situations, learned through the socialization process and often reinterpreted throughout life, which define the lifestyle, has been pointed out as the greatest direct determinant of an individual's health. In addition, it can collectively influence health, denoting the importance of its study and evaluation⁴. Some studies indicate that the lifestyle of medical students is not beneficial to their health. Problems related to the quality of sleep, food and physical activity, among others, have been pointed out^{5,6}.

The Fantastic Lifestyle Questionnaire (FLS), an instrument that was developed in 1984 at McMaster University, Canada, used to analyze lifestyle, and is validated for use in Brazil^{7,8}.

This questionnaire has already been applied to science health students, being considered a reliable instrument⁹.

Objective

Identify which structure represents the lifestyle of medical students at a public university, using the FLS questionnaire.

METHODS

This is an exploratory cross-sectional study, with a non-probabilistic sample, from which an exploratory factor analysis was performed. The inclusion criteria of the participants were: being a student from the first to the sixth year, with active enrollment in the undergraduate Medicine course, over 18 years of age, and a regular attendee of undergraduate curriculum activities. Exclusion criteria were: inaccurate or incorrect filling out of the questionnaire.

Students were invited to participate in the study through an invitation letter sent through digital communication media, such as email, WhatsApp and Facebook, from September 1, 2020 to June 30, 2021. All students agreed and signed the free,

¹Universidade Federal de São Carlos, Departamento de Medicina – São Carlos (SP), Brazil.

²Universidade Estadual Paulista "Júlio Mesquita Filho", Faculdade de Medicina de Botucatu, Departamento de Neurologia, Psicologia e Psiquiatria – Botucatu (SP), Brazil.

*Corresponding author: estherferreira@ufscar.br

Conflicts of interest: the authors declare there is no conflicts of interest. Funding: none.

Received on January 06, 2022. Accepted on February 08, 2022.

prior and informed consent document, and were fully informed about the objectives and purposes of the study, in addition to the guarantee of anonymity, as well as the guarantee of access to an electronic copy of the consent document. The answers were registered in the research administration application, which has security mechanisms, such as the non-identification of students in the form, restriction of access to answers through e-mail and password access by researchers.

The instrument used to measure the students' lifestyle was the Brazilian version of the FLS questionnaire. This questionnaire consists of nine domains: family and friends, physical activity, nutrition, smoking and drugs, alcohol, sleep, stress and safe sex, type of behavior, introspection and work. Data regarding gender, age, skin color and marital status of the participants were also collected.

Statistical analysis was performed using factor analysis, a multivariate method that provides for the reduction of a group of variables into a smaller set of factors that represent the underlying latent structural dimensions. The methodological basis of factor analysis resides in the assumption that some underlying factors, in smaller numbers than the observed variables, are responsible for the covariation between the set of variables. In this way, it is possible to identify constructs that summarize or explain the set of variables observed. For this purpose, the adequacy of the database, the extraction technique and the type of factor rotation must be observed¹⁰.

For the analyses, the Stata program version 13.0 (Statacorp, L.C.) was used. Qualitative variables are presented in percentages. For the factor analysis, the correlations between the variables were initially observed, and correlations with values greater than 0.3 in the matrix were considered adequate and the others excluded. Of the 19 variables, 10 remained in the model. This number of variables in the model in relation to the sample size resulted in a 1:5 ratio, considered appropriate. Bartlett's test of sphericity was applied, which was significant ($p < 0.001$). Subsequently, the Kaiser-Meyer-Olkin (KMO) test was applied on the selected matrix, to show the proportion of the common variance. This initial analysis revealed that factorization would be adequate.

The extraction of factors was performed using the principal components model, to estimate the best combination of variables that would explain most of the observed variance. The factors were selected by the latent root criterion (Eigenvalue), keeping those with eigenvalues greater than 1.0. The Eigenvalues were observed by the Scree graph. The rotation of the factors to adjust the loads was performed using the Varimax method. The variables were related to the factors according to their highest rotated loads and the factors were named according to the

variables with the greatest weight in their construction. For the construction of this model, parsimony was used. Variances, commonalities and factor loadings are presented.

The study was approved by the Research Ethics Committee (CAAE: 31527020.3.0000.5504).

RESULTS

The sample consisted of 61 participants and their characteristics are shown in Table 1. Regarding the global assessment of the FLS questionnaire, one participant (1.63%) had a score between 70 and 84-very good; 34 (55.73%) between 55 and 69-good; 24 (39.34%) between 35-54-regular, and two (3.27%) between 0 and 34-needs improvement.

Ten variables participated in the factor analysis:

1. I have someone to talk to about the things that are important to me;
2. I give and receive affection;
3. I am vigorously active for at least 30 minutes a day;

Table 1. Characteristics of the participants.

| Feature | N | Frequency (%) |
|-----------------------------|----|---------------|
| What is your birth sex | | |
| Male | 28 | 45.9 |
| Female | 33 | 54.1 |
| What is your marital status | | |
| Single | 54 | 88.5 |
| Married | 6 | 9.8 |
| Common-law marriage | 1 | 1.7 |
| What is your skin color | | |
| White | 35 | 57.4 |
| Brown | 20 | 32.8 |
| Black | 3 | 4.9 |
| Others | 3 | 4.9 |
| What is your religion | | |
| None | 25 | 41.0 |
| Catholic | 20 | 32.8 |
| Evangelical | 6 | 9.8 |
| Spiritist | 5 | 8.1 |
| Umbanda | 1 | 1.6 |
| Others | 4 | 6.7 |
| With whom you live | | |
| With family members | 33 | 54.1 |
| Alone | 20 | 32.8 |
| In a student republic | 8 | 13.1 |

4. I am moderately active;
5. I eat a balanced diet;
6. I often eat in excess: sugar, salt, animal fat, junk food, snacks;
7. Healthy weight range;
8. I sleep well and feel rested;
9. I am able to handle the stress of my day-to-day life;
10. I relax and enjoy my leisure time. The correlation matrix was inspected and generated a moderate KMO test (0.78). Bartlett's test of sphericity (approximate χ^2 186.66; $p < 0.001$) indicated that the correlational matrix was not an identity matrix, which was followed by a factor analysis.

The analysis of eigenvalues suggested the existence of three main factors (Table 2), which can be confirmed by the Scree graph (Figure 1).

The factor analysis model identified three factors that were named taking into account the factor loadings obtained. Thus, Factor 1 refers to the perception of sleep, diet and stress, Factor 2 refers to the perception of relationships and leisure and Factor 3 refers to the perception of activity (Figure 1). These three factors accounted for the structure found in the analyzed questionnaires.

The three factors identified explained 63.50% of the total variance observed. Varimax rotation was performed, and the summary of the results of the factor analysis is also found in Table 2.

Table 2. Results of the analysis of factor eigenvalues, proportion of explained variance and accumulated variance factor followed by the factor solution with rotated loads, commonalities, percentage of explained variance of the Fantastic Lifestyle Questionnaire applied to medical students.

| Results of the analysis of factor eigenvalues, proportion of explained variance and accumulated variance | | | | |
|--|------------|----------|----------------------|-------------|
| Factor | Eigenvalue | Variance | Accumulated Variance | |
| Factor 1 | 3.875 | 0.387 | 0.387 | |
| Factor 2 | 1.420 | 0.142 | 0.529 | |
| Factor 3 | 1.070 | 0.107 | 0.636 | |
| Factor 4 | 0.813 | 0.081 | 0.718 | |
| Factor 5 | 0.716 | 0.071 | 0.789 | |
| Factor 6 | 0.557 | 0.055 | 0.845 | |
| Factor 7 | 0.509 | 0.050 | 0.896 | |
| Factor 8 | 0.409 | 0.040 | 0.937 | |
| Factor 9 | 0.381 | 0.038 | 0.975 | |
| Factor 10 | 0.246 | 0.020 | 1.000 | |
| Factor solution with rotated loads, commonalities, percentage of explained variance of the Fantastic Lifestyle Questionnaire applied to medical students | | | | |
| Variable | Factor 1 | Factor 2 | Factor 3 | Commonality |
| 1 | | 0.804 | | 0.751 |
| 2 | | 0.863 | | 0.756 |
| 3 | | | 0.791 | 0.686 |
| 4 | | | 0.823 | 0.709 |
| 5 | 0.618 | | | 0.664 |
| 6 | 0.668 | | | 0.570 |
| 7 | 0.724 | | | 0.551 |
| 8 | 0.759 | | | 0.634 |
| 9 | 0.592 | | | 0.574 |
| 10 | | 0.501 | | 0.475 |
| Eigenvalue | 2.444 | 1.995 | 1.927 | |
| explained variance (%) | 0.244 | 0.199 | 0.192 | Total=63.50 |
| Number of variables | 5 | 3 | 2 | |
| Cronbach's Alpha | 0.760 | 0.71 | 0.69 | Total=0.81 |

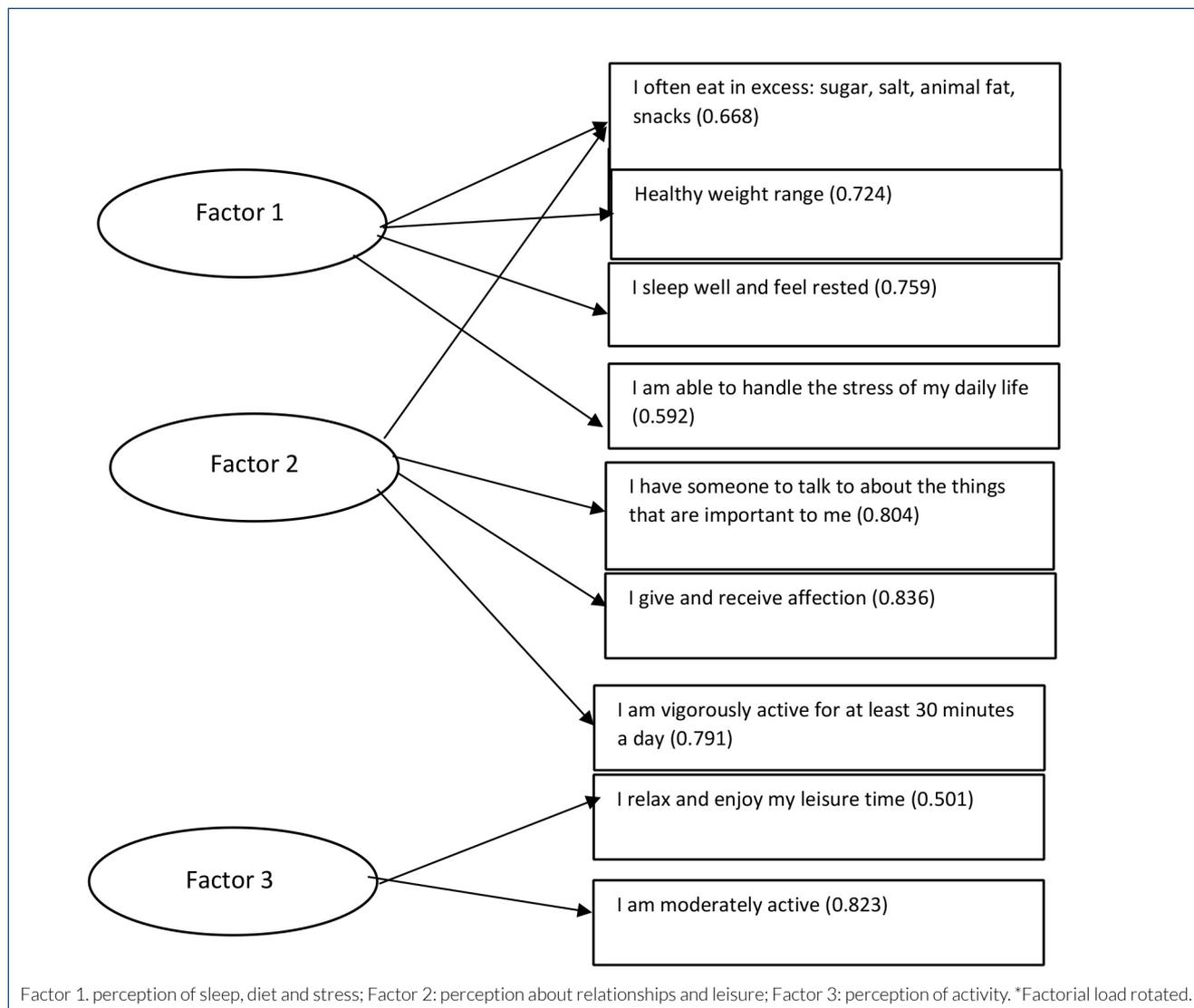


Figure 1. Model resulting from the factor analysis of the Fantastic Lifestyle Questionnaire, consisting of three factors.

DISCUSSION

This study involving medical students from a public university analyzed the multidimensional characteristics of the quality of life construct. The model resulted in three factors that explained 63.40% of all observed variance. These factors were related to the perception of sleep, food and stress, relationships, leisure and activity.

The internal consistency of the FLS questionnaire, in the context analyzed, measured by Cronbach's alpha was 0.81. This internal consistency denotes the degree of internal relationship between the items in the questionnaire and the consistency of the responses of the studied group. It has been recommended over the years that the cut-off point for the value of this statistic should be 0.70¹¹. Thus, the value reached in this study was good, revealing consistency of information.

The components of food, sleep and stress self-control were correlated and revealed great importance in this study. This result suggests that these variables were very important to determine the quality of life in this group of individuals. High factor loadings were observed for the variables “being in the range of weight considered healthy” and “sleeping well and feeling rested”. This relationship has also been described in the literature. Vernia et al. discussed the complex interrelationship that exists between sleep disorders and their relationship to poor eating habits. In fact, these disorders are considered “triggers” for digestive disorders. On the other hand, individuals who eat poorly generally sleep less and not well. All these circumstances affect the quality of life and deserve attention¹².

The second factor identified in medical students was formed by the components of relationships, affection and leisure. It is

essential to rescue the importance of this component for the construction of quality of life, especially during the COVID-19 pandemic, where people around the world underwent a process of reinvention and needed to give new meaning to their interpersonal relationships. Self-care, represented by leisure activities, was also part of this factor. It has already been pointed out that, in medical students, resilience is positively correlated with quality of life, whereas psychological stress is negatively correlated¹³. Also, self-care and work-life balance have been identified as essential in medical students not only for quality of life, but for the delivery of effective care. Medical professors must be proactive in supporting these practices in students, particularly in critical periods, such as the COVID-19 pandemic^{14,15}.

In the present study, the participant's daily activity dimension constituted the third factor, which refers to domain A of *activity*, which makes up the name FANTASTIC. In a Brazilian multicenter study that included twenty-two medical schools, it was observed that 40% of students reported not having time for physical activity. Furthermore, an association between quality of life and physical activity was revealed, including a dose-effect relationship (the greater the activity, the better the quality of life)¹⁶.

It is interesting to identify that the domains related to the use of cigarettes and drugs, alcohol and career (which represent domain C of FANTASTIC) did not participate in the making of this construct. It is worth remembering that this particularity refers to this group of individuals, as it is known that the consumption of these substances is negatively associated with quality of life. Among nursing students in Australia, alcohol consumption, physical inactivity and skipping breakfast were

associated with poor quality of life¹⁷. In the present study, career or work were not very important, possibly because they were students.

This study has limitations. First, it was carried out during the COVID-19 pandemic and, therefore, the forms were filled out online, voluntarily. The sample refers to a single public university, making it difficult to generalize the results. The small sample size may have influenced the results. However, given the lack of studies on this topic, especially in Brazil, this study contributes to the reflection on the lifestyle of medical students. Future studies with a larger sample size and after the COVID-19 pandemic may contribute to a greater understanding of the topic.

CONCLUSION

This study evaluated the components of the FLS in order to identify, in this group of medical students, which elements shape its construct. Thus, components related to the perception of sleep, food and stress, relationships, leisure and activity were identified. This result can provide substrate for actions to improve the quality of life and well-being of students at this university.

AUTHORS' CONTRIBUTIONS

JMSM: Conceptualization, Data curation, Formal Analysis, Writing – review & editing. **EALF:** Conceptualization, Data curation, Formal Analysis, Writing – review & editing. **COSV:** Data curation, Formal Analysis, Writing – review & editing. **HHFG:** Formal Analysis, Writing – review & editing.

REFERENCES

1. World Health Organization. Constitution of the World Health Organization. Basic Documents. Geneva: World Health Organization; 1946.
2. AlSaadi T, Zaher Addeen S, Turk T, Abbas F, Alkhatib M. Psychological distress among medical students in conflicts: a cross-sectional study from Syria. *BMC Med Educ*. 2017;17(1):173. <https://doi.org/10.1186/s12909-017-1012-2>
3. Guthrie E, Black D, Shaw C, Hamilton J, Creed F, Tomenson B. Embarking upon a medical career: psychological morbidity in first year medical students. *Med Educ*. 1995;29(5):337-41. <https://doi.org/10.1111/j.1365-2923.1995.tb00022.x>
4. Tavares J, Nunes L. Comportamentos de saúde e de evitamento do risco em operários fabris. *Rev Enf Ref*. 2007;2(5):23-36.
5. Corrêa CC, Oliveira FK, Pizzamiglio DS, Ortolan EVP, Weber SAT. Sleep quality in medical students: a comparison across the various phases of the medical course. *J Bras Pneumol*. 2017;43(4):285-9. <https://doi.org/10.1590/S1806-3756201600000178>
6. Muller MR, Guimarães SS. Impacto dos transtornos do sono sobre o funcionamento diário e a qualidade de vida. *Estud Psicol (Campinas)*. 2007;24(4):519-28. <https://doi.org/10.1590/S0103-166X2007000400011>
7. Wilson DMC, Nielsen E, Ciliska D. Lifestyle assessment: testing the FANTASTIC instrument. *Can Fam Physician*. 1984;30:1863-6. PMID: PMC2154238
8. Rodriguez Añez CR, Reis RS, Petroski EL. Brazilian version of a lifestyle questionnaire: translation and validation for young adults. *Arq Bras Cardiol*. 2008;91(2):92-8. <https://doi.org/10.1590/s0066-782x2008001400006>
9. Silva AM, Brito Ida S, Amado JM. Translation, adaptation and validation of the Fantastic Lifestyle Assessment questionnaire with students in higher education. *Cien Saude Colet*. 2014;19(6):1901-9. <https://doi.org/10.1590/1413-81232014196.04822013>
10. Figueiredo Filho DB, Silva Júnior JA. Visão além do alcance: uma introdução à análise fatorial. *Opin. Publica*. 2010;16(1):160-85. <https://doi.org/10.1590/S0104-62762010000100007>

11. Taylor JM. Reliability. *J Nurs Educ.* 2021;60(2):65-6. <https://doi.org/10.3928/01484834-20210120-02>
12. Vernia F, Ruscio MD, Ciccone A, Viscido A, Frieri G, Stefanelli G, et al. Sleep disorders related to nutrition and digestive diseases: a neglected clinical condition. *Int Med J Sci.* 2021;18(3):593-603. <https://doi.org/10.7150/ijms.45512>
13. Noreen A, Iqbal N, Hassan B, Ali SA. Relationship between psychological distress, quality of life and resilience among medical and non-medical students. *J Pak Med Assoc.* 2021;71(9):2181-5. <https://doi.org/10.47391/JPMA.04-611>
14. Picton A. Work-life balance in medical students: self-care in a culture of self-sacrifice. *BMC Med Educ.* 2021;21(1):8. <https://doi.org/10.1186/s12909-020-02434-5>
15. Miguel AQC, Tempski P, Kobayasi R, Mayer FB, Martins MA. Predictive factors of quality of life among medical students: results from a multicentric study. *BMC Psychol.* 2021;9(1):36. <https://doi.org/10.1186/s40359-021-00534-5>
16. Peleias M, Tempski P, Paro HBMS, Perotta B, Mayer FM, Enns SC, et al. Leisure time physical activity and quality of life in medical students: results from a multicentre study. *BMJ Open Sport Exerc Med.* 2017;3(1):e000213. <https://doi.org/10.1136/bmjsem-2016-000213>
17. Heidke P, Vandelanotte C, Irwin C, Williams S, Saluja S, Khalesi S. Associations between health-related quality of life and health behaviors in Australian nursing students. *Nurs Health Sci.* 2021;23(2):477-89. <https://doi.org/10.1111/nhs.12832>

