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## Perception of Students of the Pharmacy Course at a Higher Education Institution: a Self-assessment on a Health Individual

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### ABSTRACT

This article investigated the association between self-rated health and the socioeconomic, demographic, physical, emotional, behavioral, and academic characteristics of students in the Pharmacy course at the Federal University of Minas Gerais. We used Data from the research Evaluation of the profile of students in the undergraduate course in Pharmacy at the Federal University of Minas Gerais, developed by the Structural Teaching Center (NDE). Health perception was measured using a scale that ranged from 0 to 100, with 0 being the worst health condition and 100 being the best possible health condition. The sample of 273 students was analyzed using the statistical technique called CART (Classification and Regression Tree). The general average of the health scale was 70.6 and the standard deviation was 20.13. A positive association was observed between the behavioral characteristics, the physical, and emotional aspects experienced by the students and the health scale. The factors most strongly associated with the students' health scale were sex and having or not having a job, in that order of intensity.

### KEYWORDS

Health education. Higher education. Graduation course.

## Percepção dos Discentes do Curso de Farmácia de uma Instituição de Ensino Superior: uma Autoavaliação Sobre a Saúde Individual

### RESUMO

Este artigo investigou a associação entre a autoavaliação de saúde e as características socioeconômicas, demográficas, físicas, emocionais, comportamentais e acadêmicas dos discentes do curso de Farmácia da Universidade Federal de Minas Gerais. Foram utilizados dados da pesquisa “Avaliação do perfil de alunos do curso de graduação em Farmácia da Universidade Federal de Minas Gerais”, desenvolvida pelo Núcleo Docente Estruturante (NDE). A percepção de saúde foi mensurada por meio de uma escala que variou de 0 a 100, sendo 0 o pior estado de saúde e 100, o melhor estado de saúde possível. A amostra de 273 alunos foi analisada com a técnica estatística denominada CART (Classification and Regression Tree). A média geral da escala de saúde foi 70,6, e o desvio-padrão, 20,13. Observou-se associação positiva entre as características comportamentais, os aspectos físicos e emocionais vivenciados pelos alunos e a escala de saúde. Os fatores mais fortemente associados à escala de saúde dos discentes foram o sexo e o fato de possuir ou não trabalho com vínculo empregatício, nessa ordem de intensidade.

### PALAVRAS-CHAVE

Condições de saúde. Educação superior. Curso de graduação.

## Percepción de los Estudiantes del Curso de Farmacia en una Institución de Educación Superior: una Autoevaluación Sobre Salud Individual

### RESUMEN

Este artículo investigó la asociación entre la salud autoevaluada y las características socioeconómicas, demográficas, físicas, emocionales, conductuales y académicas de los estudiantes en el curso de Farmacia en la Universidad Federal de Minas Gerais. Se utilizaron datos de la investigación Evaluación del perfil de los estudiantes en el curso de pregrado en Farmacia en la Universidad Federal de Minas Gerais, desarrollado por el Centro de Enseñanza Estructural (NDE). La percepción de salud se midió usando una escala que varió de 0 a 100, siendo 0 la peor condición de salud y 100 la mejor condición de salud posible. La muestra de 273 estudiantes se analizó utilizando la técnica estadística llamada CART (árbol de clasificación y regresión). El promedio general de la escala de salud fue 70.6 y la desviación estándar fue 20.13. Se observó una asociación positiva entre las características de comportamiento, los aspectos físicos y emocionales experimentados por los estudiantes y la escala de salud. Los factores más fuertemente asociados con la escala de salud de los estudiantes fueron el sexo y el hecho de tener o no tener un trabajo, en ese orden de intensidad.

### PALABRAS CLAVE

Educación sanitaria. Enseñanza superior. Curso de graduación.

## Introduction

Public policies for expansion and quotas have changed higher education, especially concerning the profile of students (OLIVEIRA, 2014). This change created new challenges for educational institutions, which started to demand studies to understand the main associated characteristics. By focusing on students, the effects can affect health status and academic performance.

The Program to Support Federal University Restructuring and Expansion Plans (Reuni), implemented since 2012 in Brazil, is the main initiative of the Federal government for the expansion of Higher Education in the country. Reuni increased the number of places in the courses and increased the offer of evening courses. In 2010, the period before the Program, there were 190 public universities in Brazil, in which 2,809,974 students were enrolled (INEP, 2011). In 2016, the number of public universities in the country increased to 197 institutions and the number of students to 3,246,450 (INEP, 2017).

The Federal University of Minas Gerais (UFMG), which offers more than 70 undergraduate courses and has about 20 thousand students enrolled, in addition to the extension and research actions, benefited from the expansion policy of Higher Education. Specifically, in the Pharmacy course, the target of this study, the number of places offered increased by 10% and the evening course was created in 2012. Pharmacy is one of the courses in the health area and has a curriculum that includes disciplines in the areas of exact and biological, in addition to the professional cycle. This cycle is carried out at the Faculty of Pharmacy and is divided into four major areas: Clinical and Toxicological Analysis; Foods; Medicines and Cosmetics Industry; Hospital Pharmacy and Health Services. The course has a bachelor's degree and annually offers 132 places in the day shift and 80 in the night shift, whose duration corresponds to five and six years, respectively. In both shifts, the total workload is 4,005 hours (UFMG, 2017).

Regarding the quota system, Law No. 12,711 / 2012 guarantees a percentage of vacancies in the Unified Selection System (Sisu) for high school graduates in public schools. Federal Higher Education Institutions that have joined Sisu must reserve, at least, 50,0% of vacancies for candidates who meet this requirement (BRASIL, 2012). In addition to reserving half of the vacancies for quota holders, UFMG defines a reserve for those with income equal to or less than 1.5 minimum wages (one and a half minimum wages) per capita, self-declared blacks, browns or indigenous people and people with disabilities.

The increase in the participation of more socio-economically disadvantaged students, combined with the specificities of the Pharmacy course, may enhance the effects on the students' health status. In other words, while students from lower social classes find it more financially difficult to stay in school, the course has many disciplines and has a high workload. Thus, the analysis of the students' health status acquires relevance when considering the social determinants of health that, according to the World Health Organization (WHO), are related to the conditions in which a person lives and works. Thus,

understanding the factors capable of interfering in students' academic life is linked to the development of actions on the social determinants of health. Other factors, whether social, economic, cultural, ethnic/racial, psychological and behavioral, can also influence the occurrence of health problems (WHO, 2018).

Data related to student health were described by the National Forum of Pro-Rectors of Community and Student Affairs (Fonaprace), in 2010, in the publication on the profile of 19,691 students from 57 Federal Universities. Regarding emotional aspects, almost half of the students reported having experienced an emotional crisis in the last 12 months before the survey, such as anxiety, insomnia or significant sleep disturbance, depression and fear/panic (FONAPRACE, 2011). Baraldi *et al.* (2015) also found that quality of life factors interfered with the academic performance of students in the Nutrition course. Although the quality of life was positively assessed by 82.5% of the respondents, more than half reported the presence of negative feelings (bad mood, despair, anxiety, and depression) and dissatisfaction (dissatisfied or very dissatisfied) concerning sleep, energy for everyday life, ability to concentrate and leisure opportunities. The reported health problems can result in a lack of motivation to study, poor academic performance, retention in disciplines, change of course, and even general locking or dropping out of the course.

Besides, behavioral aspects can also interfere with health. Sousa *et al.* (2013) conducted a study with students from a public university in Northeastern Brazil to estimate the prevalence of physical activity during leisure, use of alcoholic beverages, smoking, and consumption of fruits and vegetables. Among the most prevalent negative health behaviors were the low level of physical activity (54.1%) and the high consumption of alcoholic beverages (41.3%). The dangerous or harmful use of alcohol was also investigated by Oliver *et al.* (2014), whom that found about one in four pharmacy students at Auburn University, in the United States, reported such a situation. In addition to acting as a stressor, the use of alcohol may be used to mask emotional symptoms (OLIVER *et al.*, 2014).

In this sense, the objective of this article was to describe the self-perceived health of Pharmacy' students at UFMG and to associate it with socioeconomic, demographic, physical, emotional, behavioral, and academic characteristics. In the next section, you will find the research materials and methods and a description of the statistical techniques used.

## Material and Methods

### Data Source

Data from the research "Evaluation of the profile of students in the undergraduate course in Pharmacy at the Federal University of Minas Gerais" were used, developed by the Structural Teaching Core (NDE) of this faculty (NDE, 2018). The purpose of the research was to learn about the students' views on various aspects of the course, and data collection was carried out using an electronic form from 4/16/2018 to 5/2/2018.

All students (1,065) regularly enrolled in the Pharmacy course at UFMG were contacted via e-mail, whose list was provided by the Graduate Coordination. Also, the research was disseminated on the website of the Pharmacy College, on the social media of the Academic Directory of the institution, in folders posted at the college, and in the sending of e-mail by the professors. The sample of respondents comprised 273 students, which is equivalent to a response rate of 20.5%.

### *Ethics Aspects*

The study is part of the project entitled “Evaluation of teaching and learning in Pharmacy”, submitted and approved by the Research Ethics Committee (Presentation Certificate for Ethical Appreciation - CAAE - at Plataforma Brasil nº 63329416.7.0000.5149) from UFMG. The students were invited to participate in the research, and their consent was obtained after reading the Informed Consent Form (ICF). This term was automatically forwarded to the student's email.

### *Variables Analyzed*

The dependent variable of the study was the self-perceived health by the students. This measure was evaluated using a scale with an interval from 0 to 100, without specifying any aspect or characteristic to assign meaning to the values. The polarity of the scale is positive, that is, while zero represents the worst state of health imaginable, 100 expresses the best state possible. A similar scale called Visual Analogue Scale is used as a way to measure health status in quality of life assessment studies, such as the EQ-5D<sup>1</sup> (BROOKS, 1996). However, this research did not use the visual resource, having been chosen to bring the description of the scale's polarity.

In addition to the health measure, socioeconomic, demographic, physical, emotional, behavioral, and academic characteristics of the UFMG Pharmacy students were analyzed. The socioeconomic characteristics analyzed were: a place of completion of high school (public or private school); job (were not working, were in paid employment with or without an employment contract); the main source of income (family, own work, scholarships for underprivileged students or scholarships for internship, scientific initiation, extension or others); demographics, sex, and self-declared color/race.

The physical and emotional aspects were measured using a Likert scale with five points. In it, students scored the level of agreement on issues related to illness due to the course, the pressure to study, anxiety, depression, exhaustion, an overload of studies, pain, and discomfort. The behavioral characteristics considered the use of drugs for the nervous system and the practice of physical activity, without considering the type of activity and the

<sup>1</sup> EQ-5D (EuroQol five-dimensional) is a quality of life measurement questionnaire that considers generic aspects of health, contemplating five dimensions: mobility, usual activities, self-care, pain/discomfort and anxiety/depression. In addition, it uses a Visual Analogue Scale, ranging from 0 to 100, respectively related to the worst and best imaginable health condition (BROOKS, 1996).

frequency of performance. Finally, the academic characteristics of the students: a period in the course; the shift in which he was enrolled; and the use of the quota system for admission to college.

Below, follow the statistical techniques used in the study to assess the association between self-perceived health and the variables previously mentioned.

### *Statistical Technics*

The fulfillment of the established objectives requires two statistical techniques for data analysis. The first was the analysis of variance (Anova), applied to assess the influence of the behavioral, physical, and emotional aspects of the students on the students' health scale. This technique is used to perform a comparison between media from different subgroups, and through it, it can be decided how differences observed between more than two sampled measurements can be attributed to the case, or if any related fact occurs between the media corresponding variations (WERKEMA; AGUIAR, 1996). Regarding the nature of the data, Anova requires that the variable response be continuous and the factors (or controls) strategic variables. Anova was used for one factor (or single factor), as it is analyzed for each selected factor.

The technique defined three assumptions, all satisfied with the analyzed data. The first assumption was that the variable response must be normally distributed; second concerning the independence of the groups' responses to a variable response; and a third, that the variances between groups must be equal, this being the statistical concept called homoscedasticity.

Anova only indicates the existence of a significant difference between the means of at least one subgroup. However, it does not indicate which specific subgroups have or do not have significant differences between them. In this way, multiple comparisons were made to identify all the differentiations that might be considered to exist between the subgroups.

The second statistical technique used was in the CART (Classification and Regression Tree), to identify the socioeconomic, demographic, and academic factors that most influence the self-perceived health of students at the UFMG Pharmacy. It is a decision tree built based on a variable response and a set of explanatory variables. The tree analyzed in this study is of the regression type, as it has a variable numerical response.

A great advantage of CART is the intelligibility of the results, as it allows to understand the structure of use and display all the subdivisions generated. The logic of this technique lies in the fact that trees are built through the subdivision of groups into subgroups and so on (BREIMAN *et al.*, 1998). The successive divisions of the total data set use the CHAID method (Automatic Detection of Interaction with Chi-square), each one of them. The procedure selects an independent variable that has a stronger interaction with a dependent variable. Besides, the group as categories of each variable that are not different variables concerning the dependent variable.

The analyses were performed using the IBM SPSS Statistics 22 software. The CART technical application requires that no missing data occur for both the response and explanatory variables. In this study, the assumption was reached, mainly, since the electronic data collection form does not admit the occurrence of unanswered questions.

Some criteria have been defined for the development of CART. The first is that each node - name given to each subset applied by applying a division rule - must have a minimum of 30 steps to perform and subdivide. The second is each terminal node that requires a minimum of 5 applications. The last is that the model does not consider subdivisions with a probability of significance (p-value) equal to or greater than 0.10.

In the next topic, the sample resources and the results of the statistics described above will be selected. A discussion of the data, considering the existing literature on the topic, will be held as you present the results.

## Results and Discussion

This section is divided into two topics. The first presents the characteristics of the students, considering all socioeconomic, demographic, physical emotional, behavioral, and academic variables. The second brings the results of the statistical analyzes to verify the associations between the health scale and the set of characteristics previously displayed.

### *Students Characteristics*

The sample analyzed consists of a total of 273 students from the Pharmacy course at UFMG who answered the questionnaire. Regarding demographic data, 23.4% were male and 76.6%, female. Based on the students' self-declaration about color/race, 46.2% of whites, 40.7% of browns, 8.4% of blacks, and 4.8% of them preferred not to answer this information.

Regarding socioeconomic characteristics, the completion of high school in a public school occurred for 53.1% of respondents, against 46.9% who completed it in private schools. The development of paid activity was evaluated, with 11.0% was working with a legal contract, 47.3% was working without a legal contract, and 41.8% were not working. The main source of students' income was family members (66.7%), their work (12.5%), scholarships to help needy students (8.1%) or internships, scientific initiation, extension, or others (12.8%).

Regarding academic aspects, 30.8% were between the 1st and 4th periods, 38.1% between the 5th and 10th periods, and 31.1%, above the 10th period. The study shift of 68.9% of respondents was daytime and 31.1%, nighttime. The use of a quota system for admission to the Pharmacy course occurred for 35.5% of students, against 64.5% who did not use it.



The physical and emotional characteristics were analyzed through the students' self-assessment, as shown in Table 1. Anxiety and exhaustion were the aspects with the greatest negative highlight since more than half of the respondents agreed with the fact that they were feeling them. On the other hand, the fact of feeling sick because of the Pharmacy course was the aspect with the lowest percentage of total agreement among the respondents.

**Table 1.** Distribution of Pharmacy students concerning self-assessment on physical and emotional aspects - UFMG, 2018

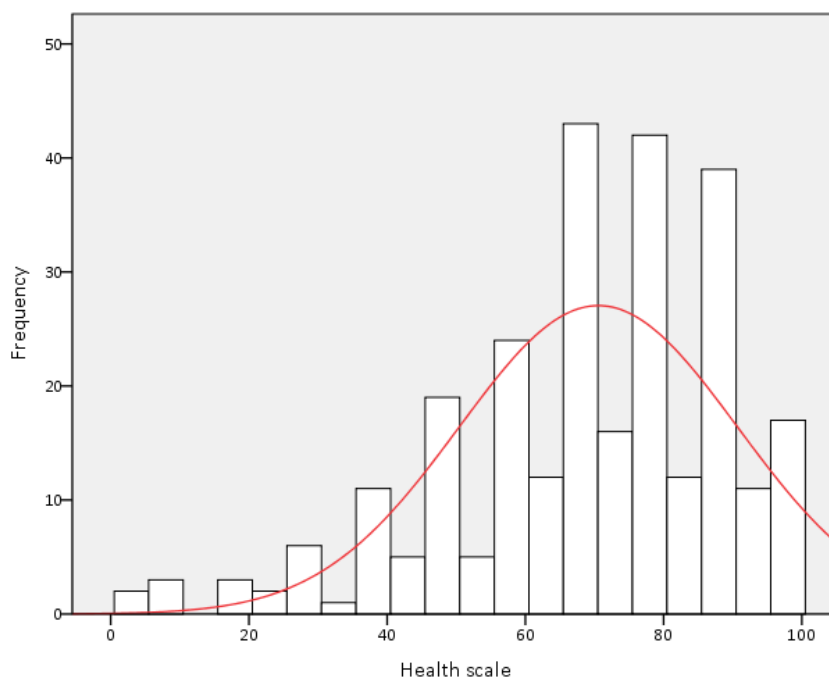
| Emotional and physical aspects          | Totally Disagree |       |       |       | Totally Agree |
|---|------------------|-------|-------|-------|---------------|
|   | 1                | 2     | 3     | 4     | 5             |
| I feel sick due to the Pharmacy course  | 24.5%            | 15.8% | 22.7% | 20.5% | 16.5%         |
| I feel pressured by the Pharmacy course | 4.8%             | 9.2%  | 16.8% | 28.6% | 40.7%         |
| I feel very anxious                     | 6.6%             | 7.0%  | 12.1% | 19.4% | 54.9%         |
| I feel very deprived                    | 25.3%            | 15.0% | 16.5% | 18.3% | 24.9%         |
| I feel exhausted                        | 3.3%             | 6.2%  | 11.7% | 23.8% | 54.9%         |
| I feel a lot of pain/discomfort         | 22.3%            | 19.4% | 17.6% | 14.7% | 26.0%         |
| I feel overload with the studies        | 1.5%             | 7.7%  | 18.3% | 25.6% | 46.9%         |

Source: Prepared by the authors, based on the research *Evaluation of Pharmacy students' profile at the Federal University of Minas Gerais* (STC, 2018).

Regarding behavioral characteristics, the use of at least one type of medication for the nervous system was registered by 21.2% of students. The practice of physical activity was mentioned by 48.7% of them.

Finally, it follows the distribution of respondents according to the variable response of the study: the self-reported health status (Graph 1). Again, it is emphasized that the scale used ranges from zero to 100 and has a positive polarity.



**Graph 1.** Histogram of health scale of Pharmacy' students – UFMG, 2018

Source: Prepared by the authors, based on the research *Evaluation of Pharmacy students' profile at the Federal University of Minas Gerais* (STC, 2018).

The descriptive measures of the students' health scale show that the lowest value recorded was 3 and the highest, 100 (Table 2). The average of students was 70.6, with a standard deviation equivalent to 20.13. The median found was 75, which allows us to state that half of the respondents had a health scale below this value, and the other half, above. Regarding the quartiles, the first quartile was equal to 60 and the third, 85.

**Table 2.** Descriptive statistical of health scale of the Pharmacy' students – UFMG, 2018

| Statistical measures |    |                    |       |
|----------------------|----|--------------------|-------|
| Minimum              | 3  | Maximum            | 100   |
| 1° Quartile          | 60 | Average            | 70,6  |
| Median               | 75 | Standard deviation | 20,13 |
| 3° Quartile          | 85 | Number of cases    | 273   |

Source: Prepared by the authors, based on the research *Evaluation of Pharmacy students' profile at the Federal University of Minas Gerais* (STC, 2018).

After the univariate analysis of the health scale, the association with socioeconomic, demographic, physical, emotional, behavioral, and academic aspects of UFMG Pharmacy students is investigated. For this, two statistical models were used, as can be seen below.

### Health Scale and Association

When considering the behavioral characteristics of the students, it was attested, through Anova, the existence of a difference between the averages of the health scales of the practitioners of physical activity and those who did not develop any modality (Table 3). The same occurred between those who took some medication for the nervous system and those who did not.

**Table 3.** Average of health scale according to behavioral characteristics of Pharmacy' students and results (p-Value) of variance analysis – UFMG, 2018

| Item                                      | Yes  | No   | p-Value |
|---|------|------|---------|
| Practices any physical activity           | 74.6 | 66.7 | 0.001   |
| Takes any medicine for the nervous system | 53.7 | 75.1 | 0.000   |

Source: Prepared by the authors, based on the research *Evaluation of Pharmacy students' profile at the Federal University of Minas Gerais* (STC, 2018).

Regarding the practice of physical activity, a higher average of the health scale was registered among students who practiced some physical activity (74.6) compared to those who did not perform them (66.7). In other words, the practice of physical activity had a positive influence on the health scale of pharmacy students.

Although the sports modality is not taken into account in the analyzes, this information was collected. Just to illustrate, among the practitioners of some type of physical activity, the most practiced sports were bodybuilding (48.9%), walking (28.6%), running (18.0%) and team sports, as is the case football, handball, and basketball (13.5%).

In a study developed by Fonaprace (2011), it was found that the lack of time was the main reason for students not to practice any physical activity. Besides, the practice of physical activities was lower among students from classes C, D, and E, that is, from the poorer. In the sample studied, the question of time may also be influencing the non-performance of physical activities, especially for students who need to work during the day and study at night. From an institutional perspective, the adoption of physical activity strategies in class breaks, can be beneficial to students, in addition to promoting solidarity between them.

Regarding the fact that students take some type of medication for the nervous system, the health scale also showed a significant average difference (Table 3). The average of the group taking some type of medication (53.7) was much lower than that recorded among students who did not use any type of medication for the nervous system (75.1).

As seen in the previous section, there is a high prevalence of medication use for the central nervous system (21.2%) among students. Regarding the type of medication used, although not included in the analysis model, the most common were antidepressants (58.6%) and anxiolytics (55.2%).

The use of medicines can be used as a proxy for the prevalence of diseases since to obtain medicines for the central nervous system, a prescription is necessary and, it is understood that there was a medical diagnosis (BRASIL, 1998). Such high prevalence values are surprising, given that the prevalence of depression in the general population is 4.13%, according to data from the National Household Sample Survey (PNAD) (BARROS *et al.*, 2011). However, Cunha *et al.*, (2009) found high values for the prevalence of the use of some type of medication among medical students (21.0%). On the other hand, through systematic review, Bacchi *et al.* (2015) found no statistically significant differences in the prevalence of depression between medical and non-medical students.

It is assumed that such a fact may be related to the moment of life that students are experiencing, pressure for results, difficulties in maintaining a social life, and financial difficulties and not to the course itself. Institutional actions of the academic listening, monitoring, and encouraging participation in cultural activities can be beneficial for some students. The role of government policies for maintaining studies is highlighted, in addition to quota policies, through research grants and financial support for low-income students.

Another association analyzed with the health scale referred to the physical and emotional aspects perceived by the students of the Pharmacy course. Measured using the Likert scale, the items showed a negative sense concerning health, so that the higher the level of agreement, the worse the average of the health scale and vice versa. All seven aspects evaluated showed a statistically significant difference between the means of at least one point on the scale (Figure 1).

**Figure 1.** Mean of health scale according to agree to grade with the emotional and physical aspects realized by Pharmacy' students – UFMG, 2018

|   | Totally agree |             |             | Totally disagree |             |
|---|---------------|-------------|-------------|------------------|-------------|
| I feel sick due to Pharmacy course      | 1<br>(82.2)   | 2<br>(74.1) | 3<br>(68.7) | 4<br>(69.9)      | 5<br>(53.2) |
| I feel pressured by the Pharmacy course | 1<br>(89.7)   | 2<br>(81.9) | 3<br>(75.3) | 4<br>(70.9)      | 5<br>(63.5) |
| I feel very anxious                     | 1<br>(85.2)   | 2<br>(81.5) | 3<br>(77.6) | 4<br>(77.3)      | 5<br>(63.5) |
| I feel very deprived                    | 1<br>(80.6)   | 2<br>(75.8) | 3<br>(73.2) | 4<br>(66.0)      | 5<br>(58.7) |
| I feel exhausted                        | 1<br>(90.0)   | 2<br>(84.9) | 3<br>(80.4) | 4<br>(73.7)      | 5<br>(64.2) |
| I feel a lot of pain/discomfort         | 1<br>(82.6)   | 2<br>(78.6) | 3<br>(70.6) | 4<br>(67.5)      | 5<br>(55.9) |
| I feel overloaded with the studies      | 1<br>(89.3)   | 2<br>(80.5) | 3<br>(79.5) | 4<br>(71.3)      | 5<br>(64.5) |

Source: Prepared by the authors, based on the research *Evaluation of Pharmacy students' profile at the Federal University of Minas Gerais (STC, 2018)*.

Note: Dash between two or more points on the scale means that there is no significant difference between the respective averages.

The worst results of the health scale were recorded among students who agreed with the most negative aspects, that is, they felt sick (53.2) and were pressured because of the Pharmacy course (63.5), anxious (63, 5), depressed (58.7), exhausted (64.2), with pain/discomfort (55.9), and/or overloaded with studies (64.5). These values were all below the general sample mean (70.6). Although Figure 1 presents different mean values among all items, the respondents of the two highest levels of agreement on the scale, the means were not statistically significant, being represented by a dash between two or more points. In other words, all the physical and emotional aspects surveyed had similar averages among students who answered 1 or 2 on the agreement scale.

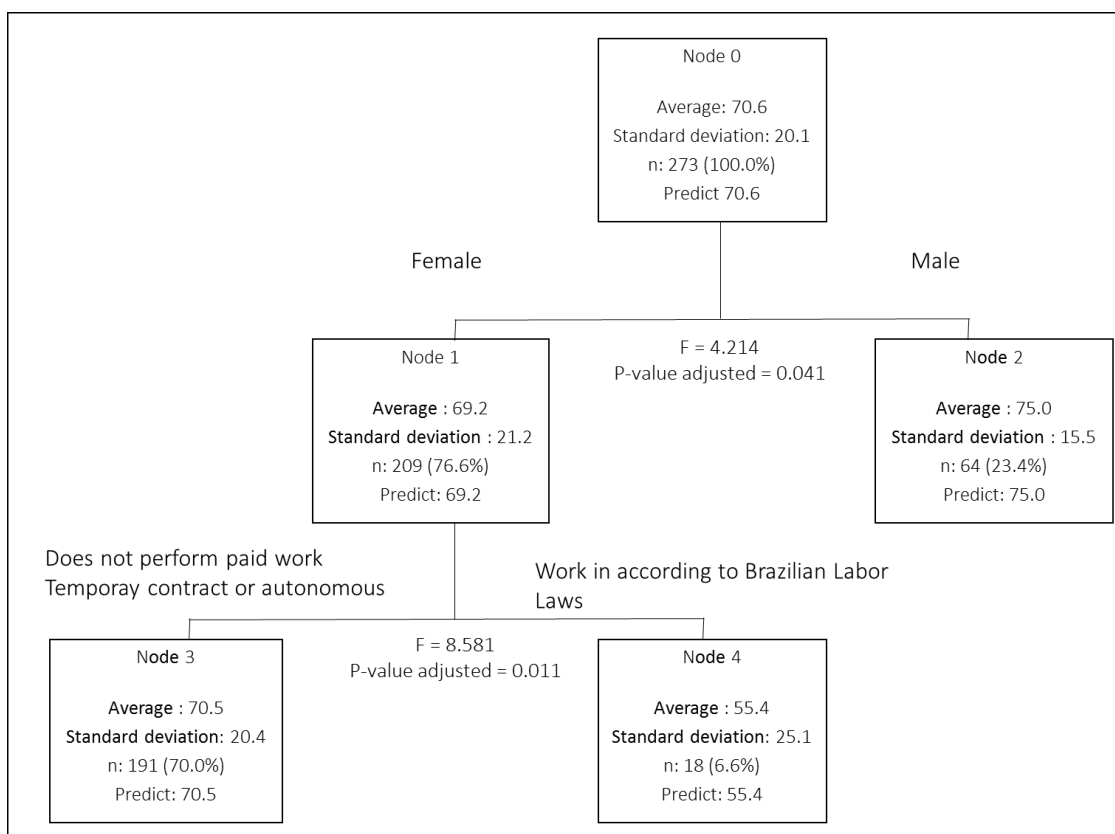
It should be noted that the lowest average values on the health scale were registered among students with the feeling of becoming ill because of the Pharmacy course (53.9), those who feel anxious (54.9%), and exhausted (54,9%). Although causal factors have not been investigated in this study, it is possible to have a relationship with the uncertainties about the choice of the course and the low professional connection with the Pharmacy in the initial years of graduation. This occurs at UFMG because, in the first two years of the course, students have to work a long time at the Institutes of Exact Sciences and Biological Sciences, carried out together with students from other courses at the university. The Pharmacy course also has a high semester load, especially in the initial periods. This fact can cause difficulties for the student to reconcile daily work and family activities to the maximum workload to be taken, which is 28 hours of classes per day during the day shift and 27 hours at night (UFMG,

2017). This hypothesis can be corroborated with the data presented by Alves *et al.* (2010), who used the period in the course to compare the quality of life of medical students in Recife, having found that the self-assessment of the quality of life of students in the first period was better than that of students in the last period.

The high expectation for the improvement of negative health outcomes influenced by the course is not exclusive to UFMG. So much so that actions related to the course start to be carried out, at a national level, by all faculties of Pharmacy based on the National Curricular Guidelines of the Pharmacy Course, promulgated in 2017. One of them provides, among other things, the insertion of internship to from the 3rd period onwards, training by competence, and the use of active teaching methodologies (BRASIL, 2017). The expectation is that actions centered on the student's role and the feeling of belonging to the course from the beginning can reduce the uncertainties and pressure felt by them.

The analysis of socioeconomic, demographic, and academic factors associated with the students' health was implemented using the CART statistical technique. The model performed divisions of the sample to consider the attributes with greater discrimination power between the subgroups. Among them, gender was the first variable considered in the segregation of students, whose health scale averages were 75.0 for men and 69.2 for women (Figure 2). From successive subdivisions, no other characteristic was significant to differentiate the subgroup of male students. In the women's group, another separation occurred when analyzing the employment relationship, resulting in a distinction between those who worked with an employment relationship and those who worked without this relationship or did not engage in any paid activity. The most disadvantaged situation was registered among students with an employment contract (Node 4), whose average health scale in this group was 55.4. It was situated at a level well below the general average (70.5) and even more distant from the average found among male students (75.0).

**Figure 2.** Regression three of health sale according to the socioeconomics, demographic and academics of Pharmacy students – UFMG, 2018



Source: Prepared by the authors, based on the research *Evaluation of Pharmacy students' profile at the Federal University of Minas Gerais* (STC, 2018).

In addition to gender and the fact that they have a job with an employment relationship, other variables were assessed but did not figure in the classification tree because they were not statistically significant. Recalling, the analysis model comprised variables related to socioeconomic and demographic characteristics (gender, color/race, completion of high school in a public school, work and main source of income) and students' academic (current shift, period, and use of the quota system for admission to the course).

In the Pharmacy course at UFMG, the universe of students comprises 1,065 students. Considering each characteristic in isolation, in the section on the description of the analyzed variables, it was shown that 76.6% of respondents were female and 11.0% had worked with an employment relationship. When associating these two variables, the share of women with an employment relationship was equivalent to 6.6% of respondents, which allows estimating the existence of 70 students in this most disadvantaged group concerning the health scale.

From an institutional perspective, individual monitoring and the proposal of targeted actions constitute strategies capable of focusing on improving the health and quality of life of this public. As a result, it is expected to improve the academic performance of these students and, ultimately, to avoid dropping out of the course. It is noteworthy that the university students themselves use the health services of the institutions, as pointed out by research data

carried out with students from federal universities, considering that 29% of the students sought psychological care, 9% psychiatric care and 10% psycho-pedagogical care (FONAPRACE, 2011).

Although certain health losses cannot be directly attributed to academic graduation, the support provided by educational institutions has the potential to minimize such effects. Research of this type invites reflection on how the health and well-being of students are affected during professional training. Thus, the hegemony of the curriculum begins to lose strength at the expense of the insertion of aspects aimed at student support.

The need to combine work and studies can have effects on the health and quality of life of students, which demands attending classes and dedicating to work activities. The scarcity of time emerges as a harmful aspect to university students, as it is capable of generating physical, family, and emotional disorders and directly affecting students' academic performance. Regarding life habits, in addition to hindering academic activities outside the classroom, insufficient time is associated with inappropriate lifestyle habits, such as lack of time for rest and leisure, insufficient sleep and the impossibility of dedicating themselves to other training activities (updating courses, lectures, languages) aimed for professional and academic improvement. It is noteworthy that the fact of reconciling work and study is not optional since most students need remuneration to support themselves.

## Conclusion

The educational policies implemented in Brazil, especially Reuni and the quota system for university access, allowed a greater number of people from the poorest strata of the population to reach this level of education. Given this, the institutional challenge is to establish strategies to keep these students in universities. Especially in courses with high dropout rates, such as the Pharmacy.

The results found a statistically significant association between behavioral factors and the health scale of pharmacy students. Physical activity practitioners had better ratings than those who did not practice any activity. Similarly, those who did not take medication for the nervous system had better evaluations than those who administered some type of medication.

The physical and emotional aspects also influenced the students' health scale. The results showed that students who claimed to feel sick, anxious, pressured by the Pharmacy course, depressed, exhausted, with pain and discomfort, registered lower values in terms of health.

The average health scale of the students was 70.6. The socioeconomic, demographic, and academic factors most strongly associated with low values on the health scale were the female gender (69.2) and the fact of having an employment relationship (55.4). For men, the average was 75.0, and among those who did not have a paid job (70.5). Thus, when specifying the characteristics of students in the most unfavorable situation concerning the health scale, the priority audience for the development of corrective and/or preventive actions that may directly affect the health of students, stands out.



The health scale allowed to represent several researched aspects related to the health of the students, having registered a significant association with socioeconomic, demographic, physical, emotional, behavioral, and academic characteristics of this audience. Thus, the health scale can be used briefly as a measure capable of expressing different aspects of students' health. It could, for example, be incorporated into the evaluations at the end of the semester so that political and pedagogical actions could be planned and monitored to improve the general state of students.

Although we cannot simply extrapolate the results of this sample to other Pharmacy courses in the country, some properties can bring it closer to the reality of other institutions. The first is that the Pharmacy course at UFMG has a high number of students, many of them coming from different regions of the state of Minas Gerais and the country. The other is that Pharmacy courses in Brazil are highly similar in terms of the total number of hours and mandatory subjects to be taken.

### Interest Conflicts

The authors declare that there are no conflicts of interest that may have changed the direction of the results. The project did not receive financial support from any institution.

### References

- ALVES, João Guilherme Bezerra *et al.* Qualidade de vida em estudantes de Medicina no início e final do curso: avaliação pelo Whoqol-bref. **Rev. bras. educ. med.**, Rio de Janeiro, v. 34, n. 1, p. 91-96, Mar. 2010.
- BACCHI S, Licinio J. Qualitative Literature Review of the Prevalence of Depression in Medical Students Compared to Students in Non-medical Degrees. **Acad Psychiatry**, United States, v. 39, n. 3, p. 293-9, 2015.
- BARALDI, Solange *et al.* AVALIAÇÃO DA QUALIDADE DEVIDA DE ESTUDANTES DE NUTRIÇÃO. **Trab. educ. saúde**, Rio de Janeiro, v. 13, n. 2, p. 515-531, Aug. 2015 .
- BARROS, Marilisa Berti de Azevedo *et al.* Tendências das desigualdades sociais e demográficas na prevalência de doenças crônicas no Brasil, PNAD: 2003- 2008. **Ciênc. saúde coletiva**, Rio de Janeiro, v. 16, n. 9, p. 3755-3768, Sept. 2011.
- BRASIL. Ministério da Saúde. Secretaria de Vigilância em Saúde. Portaria nº 344 e suas atualizações, de 12 de maio de 1998. Aprova o Regulamento Técnico sobre substâncias e medicamentos sujeitos a controle especial. Diário Oficial da União, 31 dez. 1998.
- BRASIL. Presidência da República. Casa Civil. Lei nº 12.711, de 29 de agosto de 2012. Dispõe sobre o ingresso nas universidades federais e nas instituições federais de ensino técnico de nível médio e dá outras providências. Diário Oficial da União, 30 ago. 2012.

BRASIL. Ministério da Educação. Resolução Nº 6, de 19 de outubro de 2017. Institui as Diretrizes Curriculares Nacionais do Curso de Graduação em Farmácia e dá outras providências. Diário Oficial da União, 20 out. 2017.

BREIMAN, Leo *et al.* **Classification and Regression Trees**. Reprint. CRC Press, 1998. p. 20-21

BROOKS R. **EuroQol: the current state of play**. Health Policy, 37 (1996), pp. 53-72

CUNHA, Marco Antonio Buch *et al.* Transtornos psiquiátricos menores e procura por cuidados em estudantes de Medicina. **Rev. bras. educ. med.**, Rio de Janeiro, v. 33, n. 3, p. 321-328, Sept. 2009 .

FÓRUM NACIONAL DE PRÓ-REITORES DE ASSUNTOS COMUNITÁRIOS E ESTUDANTIS (FONAPRACE). **Perfil socioeconômico e cultural dos estudantes de graduação das universidades federais brasileiras**. Brasília: Associação Nacional dos Dirigentes das Instituições Nacionais de Ensino Superior (Andifes); 2011.

INSTITUTO NACIONAL DE ESTUDOS E PESQUISAS EDUCACIONAIS ANÍSIO TEIXEIRA (INEP). **Sinopse Estatística da Educação Superior 2010**. Brasília: Inep, 2011. Available on: <http://portal.inep.gov.br/basica-censo-escolar-sinopse-sinopse>. Access on: 14 ago. 2018.

INSTITUTO NACIONAL DE ESTUDOS E PESQUISAS EDUCACIONAIS ANÍSIO TEIXEIRA (INEP). **Sinopse Estatística da Educação Superior 2016**. Brasília: Inep, 2017. Available on: <http://portal.inep.gov.br/basica-censo-escolar-sinopse-sinopse>. Access on: 14 ago. 2018.

STRUCTURAL TEACHING CORE (STC). **Base de dados**. Avaliação do perfil dos alunos do curso de graduação em Farmácia da Universidade Federal de Minas Gerais. Belo Horizonte: Faculdade de Farmácia/UFMG, 2018.

OLIVEIRA, Nara Rejane Cruz de; PADOVANI, Ricardo Da Costa. Saúde do estudante universitário: uma questão para reflexão. **Ciênc. saúde coletiva**, Rio de Janeiro, v. 19, n. 3, p. 995-996, Mar. 2014 .

OLIVER, Wesley *et al.* Alcohol use behaviors among pharmacy students. **Am J Pharm Educ**. vol. 12, n. 78, 2014

SOUSA, Thiago Ferreira de; JOSE, Helma Pio Mororó; BARBOSA, Aline Rodrigues. Conduas negativas à saúde em estudantes universitários brasileiros. **Ciênc. saúde coletiva**, Rio de Janeiro , v. 18, n. 12, p. 3563-3575, Dec. 2013.

UNIVERSIDADE FEDERAL DE MINAS GERAIS (UFMG). Faculdade de Farmácia. **Projeto Pedagógico do curso de Farmácia da UFMG**. Versão V. Outubro de 2017.

WERKEMA, Maria Cristina Catarino; AGUIAR, Sílvio. **Planejamento e análise de experimentos: como identificar e avaliar as principais variáveis influentes em um processo**. Belo Horizonte: Fundação Christiano Ottoni, Escola de Engenharia da UFMG, 1996. p. 54

WORLD HEALTH ORGANIZATION (WHO). **Social Determinants of Health**. Available on: [http://www.who.int/social\\_determinants/en/](http://www.who.int/social_determinants/en/). Access on: ago 2018.