

# QUALITY OF LIFE OF UNIVERSITY STUDENTS AND THEIR ACADEMIC PERFORMANCE

*Qualidade de vida do estudante universitário e o rendimento acadêmico*

*Calidad de vida del estudiante universitario y su rendimiento académico*

Original Article

## ABSTRACT

**Objective:** To characterize the quality of life (QOL) of students in the areas of human, exact and health sciences, correlating with the academic performance index (API). **Methods:** Cross-sectional study conducted at the Federal University of Juiz de Fora (FUJF-MG) in years 2014 and 2015, with a sample of 492 students. The WHOQOL-BREF questionnaire was applied, in conjunction with a complementary questionnaire. The WHOQOL-BREF average scores were calculated and the API was dichotomized in high and low API. The Student's t-test was used to evaluate the association of the QOL domains with the API, and the Spearman's correlation coefficient was applied to investigate the association between each question of the questionnaires and the students' API. **Results:** The human sciences area had the highest average API value and presented significant difference ( $p \leq 0.05$ ) between the mean of students with high and low API in the most domains and facets of the QOL, in contrast with the API of exact and health sciences, which showed association with only one domain: psychological ( $p \leq 0.05$ ) and environment ( $p \leq 0.05$ ), respectively. There was correlation between the API of health sciences and only four aspects of QOL ( $p \leq 0.05$ ), and the self-discipline aspect was correlated with the API in the three areas ( $p \leq 0.05$ ). **Conclusion:** The human sciences area achieved the best averages for most domains of QOL. The API of human sciences students was associated with a greater number of facets of QOL. There was only one API association common to all three areas evaluated, with the self-assessment regarding self-discipline, organization and planning of study activities.

**Descriptors:** Health Promotion; Quality of Life; Education, Higher.

## RESUMO

**Objetivo:** Caracterizar a qualidade de vida (QV) de estudantes das áreas de humanas, exatas e da saúde, relacionando com o índice de rendimento acadêmico (IRA). **Métodos:** Estudo do tipo transversal, realizado na Universidade Federal de Juiz de Fora (UFJF-MG) nos anos de 2014 e 2015, tendo como amostra 492 acadêmicos. Aplicou-se o instrumento WHOQOL-bref em conjunto com um questionário complementar. Calculou-se média dos escores do WHOQOL-bref e dicotomizou-se o IRA em alto e baixo. Aplicou-se o teste t de Student para verificar a diferença entre os domínios da QV com o IRA (alto e baixo) e o coeficiente de Spearman para correlacionar as questões dos questionários com o IRA dos estudantes. **Resultados:** A área de humanas teve o maior valor de média para o IRA e apresentou diferença significativa ( $p \leq 0,05$ ) entre as médias dos estudantes de alto IRA e baixo IRA na maioria dos domínios e facetas da QV, diferente do IRA das áreas de exatas e saúde que obteve associação apenas com um domínio: o psicológico ( $p \leq 0,05$ ) e meio ambiente ( $p \leq 0,05$ ), respectivamente, tendo o IRA da área da saúde se correlacionado com apenas quatro aspectos da QV ( $p \leq 0,05$ ), e o aspecto sobre autodisciplina correlacionado com o IRA das três áreas ( $p \leq 0,05$ ). **Conclusão:** A área de humanas obteve as melhores médias para a maioria dos domínios da QV. O IRA dos acadêmicos de humanas teve associação com um maior número de facetas da QV. Obteve-se uma única associação do IRA comum às três áreas avaliadas, com a questão autoavaliação sobre autodisciplina, organização e planejamento das atividades de estudo.

**Descritores:** Promoção da Saúde; Qualidade de Vida; Ensino Superior.

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## RESUMEN

**Objetivo:** Caracterizar la calidad de vida (CV) de estudiantes de las áreas de ciencias humanas, exactas y de la salud correlacionando con el Índice de Rendimiento Académico (IRA).

**Métodos:** Estudio del tipo transversal realizado en la Universidad Federal de Juiz de Fora (UFJF-MG) en los años de 2014 y 2015 con una muestra de 492 académicos. Se aplicó el instrumento WHOQOL-bref asociado a un cuestionario complementario. Se calculó la media de las puntuaciones del WHOQOL-bref y se clasificó el IRA en alto y bajo. Se aplicó la prueba t de Student para verificar la diferencia entre los dominios de la CV con el IRA (alto y bajo) y el coeficiente de Spearman para correlacionar los ítems de los cuestionarios y el IRA de los estudiantes. **Resultados:** La área de ciencias humanas tuvo la mayor media del IRA y presentó diferencia significativa ( $p \leq 0,05$ ) entre las medias de los estudiantes con alto IRA y bajo IRA en la mayoría de los dominios y aspectos de la CV distinto del IRA de las áreas de ciencias exactas y de la salud que se asoció solamente con un dominio: el psicológico ( $p \leq 0,05$ ) y el medio ambiente ( $p \leq 0,05$ ), respectivamente, con el IRA del área de ciencias de la salud correlacionándose solamente con cuatro aspectos de la CV ( $p \leq 0,05$ ) y el aspecto de autodisciplina correlacionó con el IRA de las tres áreas ( $p \leq 0,05$ ). **Conclusión:** El área de ciencias humanas obtuvo las mejores medias para la mayoría de los dominios de la CV. El IRA de los académicos de ciencias humanas se asoció con un mayor número de aspectos de la CV. Hubo una única asociación del IRA común a las tres áreas evaluadas con la cuestión de autoevaluación sobre autodisciplina, organización y planeamiento de las actividades de estudio.

**Descriptor:** Promoción de la Salud; Calidad de Vida; Educación Superior.

## INTRODUCTION

The concept of quality of life (QOL) is very wide, given its multidimensional and subjective character<sup>(1)</sup>. This expression was first appreciated in the speech of a President of the United States in the year 1964. From that event on, the term was broadly spread around the world, becoming a daily jargon. Nevertheless, even today, it remains without a precise definition, due to the high degree of complexity of the theme and, therefore, there is no consensus about it<sup>(1,2)</sup>.

In the 1990s, the World Health Organization (WHO), through the project named The WHOQOL Group, defined quality of life as: "the individual's perception of their position in life, in the context of the culture and value systems in which they live and in relation to their objectives, expectations, standards and concerns"<sup>(3)</sup>. However, studies still differ on certain aspects of the QOL definition and on its possible indicators, which can comprise from per capita income to personal satisfaction<sup>(4)</sup>. In this scenario, the concept of "quality of life" is object of interest of

social, human, biological and political sciences, in order to include and emphasize broader parameters than the control of symptoms, the mortality decrease, or life expectancy increase<sup>(5)</sup>.

However, the interest in learning about the QOL of the higher education student is recent<sup>(2)</sup>. As for researches relating quality of life to other influential variables, there is a limited number of investigations<sup>(6)</sup>, as well as for those that evaluate and compare the quality of life among students of different areas of education with academic achievement<sup>(4,7)</sup>.

An example of a study in this line of research occurred at the University of Serbia, which compared the quality of life among students from different areas of practice, through the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), and found the worst quality of life indexes among medical students, especially in the dimensions of vitality, mental health, and emotional aspects. In that study, both the total score and the seven dimensions of the SF-36 questionnaire correlated with the academic performance<sup>(8)</sup>.

Additionally, other evaluations with university students have shown that satisfaction with academic life is directly related to better career decisions, personality, optimism, sense of identity and orientation to work, as well as to academic achievement and satisfaction with the activities developed in the course<sup>(9)</sup>.

In this context, the theme has been proved relevant, as it interferes with undergraduate students' health, level of school dropout and academic performance, and can thus have repercussions on the future professional life<sup>(9)</sup>. Furthermore, studies on students' quality of life make it possible for managers to learn about possible problems and encourage the adoption of public policies aimed at improving the quality of life of this group, in particular<sup>(10)</sup>.

Since there is a significant relationship between students' quality of life and health promotion<sup>(10)</sup>, studies addressing the quality of life of university students are able to provide important information to guide the planning of an intervention project for promotion of health and academic success within the university environment<sup>(11)</sup>. An example of such interventions took place at the University of Pannonia, Hungary, which implemented a course to strengthen health awareness, thus contributing, in the short term, to health-preservation training and, in the long term, to the quality of life of university students<sup>(12)</sup>.

Therefore, it is relevant to identify the quality of life of university students and relate it to the index of academic performance, because this allows awareness of the need for changes and improvement of supporting measures aimed at improving the development of the student body, justifying the importance of performing the present study. Given that, the objective of this study is to characterize the quality of

life (QOL) of students of human, exact and health areas, and relate it to the academic performance index (API).

## METHODS

This is an original study with a cross-sectional design, of quantitative, exploratory and descriptive nature. It was carried out at the Federal University of Juiz de Fora (UFJF), Minas Gerais, Brazil, starting in August 2014 and extending until 2015.

The UFJF has 34 undergraduate courses, of which five were selected in each of the three areas of knowledge investigated (human, exact and health sciences). Of the five courses in each of these three areas (Law, Administration, Journalism, Letters, Pedagogy, Civil Engineering, Mechanical Engineering, Electrical Engineering, Exact Sciences, Computer Sciences, Medicine, Dentistry, Nursing, Physical Therapy and Physical Education) were selected the students (34 from each of the health sciences courses and 33 from each of the other courses) to compose the sample.

The study randomly included participants who met the inclusion criteria: being regularly enrolled and regularly attending one of the UFJF undergraduate courses (at least 15 credits); being in the fourth, fifth or sixth period, and aged  $\geq 18$  years. Questionnaires interrupted for any reason and incomplete data were defined as sample loss.

This is a non-probabilistic research, which generated the sample selection by convenience, in which the researcher selects the elements to which he has access. The sample size was 500 individuals, whose sampling spectrum strictly meets the criteria and statistical needs, considering a 5% sampling error (for more or for less). In the present study, there was a sample loss of 8 elements, thus making the real value of  $n$  equal to 492.

The World Health Organization Quality of Life - brief questionnaire (WHOQOL-BREF), Portuguese version, structured in domains (Chart I) was used as data collection instrument, comprising 26 multiple choice questions on a Likert scale, having its Portuguese version validated (Brazil) <sup>(13)</sup>. According to the methodology recommended for the version of this instrument, the psychometric characteristics met the required performance criteria: internal consistency, discriminant validity, convergent validity, criterion validity and test-retest reliability <sup>(13)</sup>. In addition, a complementary questionnaire specifically structured for the present study, based on the literature, composed of nine multiple choice questions and one open question concerning the value of the academic performance index (API). Trained researcher, in a standardized way, invited each participant, who received

detailed information about the study, voluntarily consenting to their participation by signing the Informed Consent Form.

Descriptive and exploratory statistics were performed using absolute frequencies ( $n$ ), relative frequencies (%), measures of central tendency (mean and median) and measures of dispersion (standard deviation). The syntax for WHOQOL-BREF analysis was adapted following the WHO guidelines on which the studies are based <sup>(6)</sup>.

In order to verify differences between the means of the scores obtained in the quality of life domains in the categories analyzed (high API and low API), the Student's  $t$ -test was used for independent samples. Levene's test was used to assess the homogeneity of variances, and the Kolmogorov-Smirnov test was used to verify the normality of the QOL scores and API values, which indicated the normal distribution. As a cut-off point for dichotomizing the variable academic performance, the API was characterized according to the median value of each of the areas in order to compare, by means of Student's  $t$  test, whether there is a statistically significant difference ( $p \leq 0.05$ ) in the mean scores for each domain between students with high API (values higher than the median value) and students with low API (lower than the median).

In addition, Spearman's non-parametric correlation was applied in order to evaluate the facets and questions of the questionnaires used in the study, that presented a significant correlation with the API of the students in the sample obtained. For the interpretation of the magnitude of the correlations, the following classification of the correlation coefficients was adopted:  $|r|=0$  (non-existing correlation);  $0 < |r| \leq 0.3$  (low magnitude correlation);  $0.3 < |r| \leq 0.7$  (moderate magnitude correlation);  $0.7 < |r| \leq 0.99$  (strong magnitude correlation);  $|r|=1$  (perfect correlation), where  $|r|$  was the absolute value of the Spearman's correlation coefficient <sup>(14)</sup>.

In the analyses,  $p \leq 0.05$  was adopted as level of significance for a 95% confidence interval.

All the ethical aspects provided for in Resolution no. 466/12 were respected, and the present study was approved by the Human Research Ethics Committee of UFJF, under opinion no. 872920, emphasizing the signing of the letter of agreement by the UFJF Magnificent Rector, authorizing the conduction of the current research.

## RESULTS

The present study had the participation of 492 UFJF university students, of whom 280 were female (56.9%) and 212 were male (43.1%); 169 of them were from the human area, 158 from the exact area and 165 from the health area.

Chart I - Questions of the Complementary Questionnaire and WHOQOL-BREF domains with their respective facets. Juiz de Fora, MG, 2014.

Domains	Facets
General	F1. How would you rate your quality of life? F2. How satisfied are you with your health? F3. To what extent do you think your (physical) pain prevents you from doing what you need? F4. To what extent do you need some medical treatment to run your daily life?
Physical	F10. Do you have enough energy for your everyday life? F15. How well can you move around? F16. How satisfied are you with your sleep? F17. How satisfied are you with your ability to perform your everyday activities? F18. How satisfied are you with your ability to work?
Psychological	F5. How much do you enjoy life? F6. To what extent do you think your life makes sense? F7. How much can you concentrate? F11. Are you able to accept your physical appearance? F19. How satisfied are you with yourself? F26. How often do you have negative feelings such as moodiness, despair, anxiety, depression?
Social relationships	F20. How satisfied are you with your personal relationships (friends, relatives, acquaintances, colleagues)? F21. How satisfied are you with your sex life? F22. How satisfied are you with the support you receive from your friends?
Environment	F8. How safe do you feel in your daily life? F9. How healthy is your physical environment (climate, noise, pollution, attractions)? F12. Do you have enough money to meet your needs? F13. How available to you is the information you need in your daily life? F14. To what extent do you have opportunities for leisure activity? F23. How satisfied are you with the conditions of the place where you live? F24. How satisfied are you with your access to health services? F25. How satisfied are you with your means of transportation?
Complementary questionnaire	Questions
	Q1. What is the current value of your academic performance index (API)? Q2. How satisfied are you with your course? Q3. Where do you live? Q4. How much of your time per week do you actually use with optional activities (monitoring, internship, scientific initiation, elective subjects, extension and research projects, professional training, academic leagues, etc.)? Q5. What is the average duration of your sleep at night? Q6. If you doze or sleep during the day, what is the average duration of your sleep during the day? Q7. If you are a smoker, how many cigarettes do you smoke per day? Q8. In a normal week, how many doses of alcoholic beverage do you drink? (1 serving = ½ bottle of beer or 1 cup (90 ml) of wine or 1 can of ice drink or 1 glass of draft beer or 1 cup (30 ml) of <i>cachaça</i> (Brazilian sugar cane liquor) / whiskey / vodka) Q9. How many hours per week do you practice physical activity? Q10. How would you rate your self-discipline, organization and planning of your study activities?

Table I shows the mean, median and standard deviation of the API, and in the following lines are shown the statistical measures of central tendency and dispersion of each domain of the WHOQOL-BREF quality of life questionnaire for the three major areas of knowledge: human, exact and health sciences.

The mean API of the participants was 74.94 (median 76.78), with standard deviation of 11.06, minimum value of 40 and maximum of 96.

In human sciences, the mean API was 78.03 ( $\pm 10.24$ ), with a minimum value of 34 and a maximum of 96. In exact sciences, the mean API was 68.78 ( $\pm 12.49$ ), with a minimum value of 40 and a maximum of 96. In health sciences, the mean API was 77.67 ( $\pm 7.45$ ), with a minimum value of 60 and a maximum of 92.

It is observed that the human area has the highest mean (78.0) and median (80.0) values for the API, followed by the health area values (mean of 77.6 and median of 78.0). That is, the exact area has, on average, the lowest API (mean of 68.7 and median of 70.2) of the three areas.

In relation to the domains of quality of life, the area of human sciences had the highest mean values in all domains, except for the environment one, whose highest mean occurred in the area of the exact sciences, with the worst mean in this domain found in the health area. Continuing to compare the exact sciences area to the health sciences area in the domains related to physical health and social relationships, the exact students presented a slightly higher mean than the health area students. Thus, the students of health-related courses had higher means than the students of

Table I. Descriptive analysis of the academic performance index (API) and scores of quality of life domains. Juiz de Fora, MG, 2014.

Variables	Human			Exact			Health		
	Mean	Median	$\pm DP$	Mean	Median	$\pm DP$	Mean	Median	$\pm DP$
API	78.0	80.0	10.2	68.7	70.2	12.4	77.6	78.0	7.4
QOL*- General	73.9	75.0	16.1	70.4	75.0	17.3	72.5	75.0	18.2
QOL*- Physical	52.5	53.5	10.5	50.7	51.7	11.2	50.0	50.0	12.1
QOL*- Psychological	65.5	66.6	10.8	62.3	62.5	11.2	63.3	66.6	12.0
QOL*- Social relationships	75.3	75.0	10.0	73.7	75.0	16.8	72.9	75.0	15.2
QoL*- Environment	60.4	62.5	14.8	60.7	62.5	14.2	59.4	59.3	14.4

API: Academic Performance Index; QOL\*: Quality of Life; SD: Standard Deviation.

Table II. Comparison of mean scores of the quality of life domains between students with high and low API, by sciences area. Juiz de Fora, MG, 2014.

Sciences Area and Domains	API		p-value
Human	API<80	API>80	
General*	70.8 $\pm$ 16.1	76.8 $\pm$ 15.7	0.015*
Physical	52.5 $\pm$ 10.1	52.6 $\pm$ 10.8	0.980
Psychological*	63.6 $\pm$ 10.9	67.2 $\pm$ 10.5	0.029*
Social relationships*	72.6 $\pm$ 16.2	77.8 $\pm$ 15.6	0.035*
Environment*	57.1 $\pm$ 14.6	62.0 $\pm$ 13.7	0.029*
Exact	API<70	API>70	
General	69.4 $\pm$ 17.5	71.4 $\pm$ 17.2	0.467
Physical	49.8 $\pm$ 12.3	51.7 $\pm$ 10.0	0.282
Psychological*	60.3 $\pm$ 11.2	64.4 $\pm$ 11.0	0.021*
Social relationships	75.1 $\pm$ 17.0	72.5 $\pm$ 16.8	0.334
Environment	59.9 $\pm$ 15.4	61.6 $\pm$ 13.1	0.464
Health	API<78	API>78	
General	71.5 $\pm$ 17.6	74.1 $\pm$ 18.9	0.382
Physical	50.2 $\pm$ 10.8	49.8 $\pm$ 14.0	0.863
Psychological	63.2 $\pm$ 11.1	63.7 $\pm$ 13.0	0.810
Social relationships	74.2 $\pm$ 14.8	71.3 $\pm$ 15.9	0.228
Environment*	57.1 $\pm$ 14.6	62.0 $\pm$ 13.7	0.029*

\* Student's t test indicates a significant difference ( $p < 0.05$ ) between the mean scores of the quality of life domains of students with high and low academic performance index (API).

exact sciences area only in the psychological domain (mean of 63.3 for health sciences and 62.3 for exact sciences) and in the general domain (mean of 72.5 for health sciences and 70.4 for exact sciences) of quality of life.

Table II shows the mean and standard deviation of each domain (general, physical, psychological, social relationships and environment) in the human, exact and health sciences, respectively.

Table III. Relationship between the academic performance index (API) and the facets/questions of the questionnaires, by area. Juiz de Fora, MG, 2014.

Variables	Human		Exact		Health	
	r	p-value	r	p-value	r	p-value
<b>Facets versus API</b>						
F1 vs. API	0.246**	0.001	- 0.004	0.955	0.112	0.152
F2 vs. API	0.048	0.533	0.080	0.320	0.109	0.162
F3 vs. API	- 0.185*	0.016	- 0.066	0.410	- 0.189*	0.015
F4 vs. API	- 0.176*	0.022	0.018	0.824	0.094	0.231
F5 vs. API	0.077	0.318	0.017	0.837	- 0.073	0.350
F6 vs. API	0.169*	0.028	0.077	0.337	0.050	0.522
F7 vs. API	0.215**	0.005	0.246**	0.002	0.143	0.067
F8 vs. API	0.085	0.275	0.143	0.073	0.113	0.148
F9 vs. API	0.124	0.109	- 0.010	0.904	0.208**	0.007
F10 vs. API	0.020	0.792	- 0.053	0.510	- 0.015	0.846
F11 vs. API	0.053	0.494	- 0.057	0.479	- 0.017	0.830
F12 vs. API	0.294**	0.000	0.030	0.706	0.116	0.136
F13 vs. API	0.157*	0.042	0.079	0.322	0.014	0.859
F14 vs. API	0.006	0.938	- 0.044	0.580	0.057	0.464
F15 vs. API	0.028	0.714	0.076	0.344	0.073	0.354
F16 vs. API	- 0.034	0.661	0.031	0.703	- 0.045	0.567
F17 vs. API	0.242**	0.002	0.108	0.178	0.001	0.991
F18 vs. API	0.210**	0.006	0.096	0.229	- 0.039	0.619
F19 vs. API	0.188*	0.015	0.163*	0.040	0.053	0.502
F20 vs. API	0.038	0.621	- 0.079	0.324	0.055	0.482
F21 vs. API	0.132	0.087	- 0.167*	0.036	- 0.131	0.094
F22 vs. API	0.116	0.134	0.066	0.410	0.011	0.887
F23 vs. API	0.099	0.199	- 0.024	0.767	0.076	0.330
F24 vs. API	0.157*	0.042	0.125	0.118	0.138	0.077
F25 vs. API	0.018	0.811	0.049	0.537	0.099	0.206
F26 vs. API	- 0.100	0.197	- 0.027	0.733	- 0.033	0.676
<b>Questions versus API</b>						
Q2 vs. API	0.082	0.287	0.240**	0.002	- 0.006	0.938
Q3 vs. API	- 0.158*	0.040	- 0.090	0.262	- 0.094	0.228
Q4 vs. API	0.146	0.058	0.201*	0.011	0.068	0.382
Q5 vs. API	0.113	0.144	0.083	0.297	0.023	0.767
Q6 vs. API	- 0.010	0.899	- 0.158*	0.047	0.088	0.263
Q7 vs. API	- 0.233**	0.002	- 0.102	0.202	- 0.056	0.477
Q8 vs. API	0.051	0.513	- 0.215**	0.007	- 0.165*	0.034
Q9 vs. API	- 0.044	0.574	- 0.025	0.752	0.116	0.137
Q10 vs. API	0.335**	0.000	0.386**	0.000	0.239**	0.002

\*Spearman's correlation test indicates a significant difference ( $p < 0.05$ ). \*\*Spearman's correlation test indicates significant difference ( $p < 0.01$ ). The value of r indicates the magnitude of the correlation between the academic performance index (API) and facet (F)/question (Q) of the questionnaires applied to the students of the three areas evaluated. vs.: versus.

With respect to the human sciences, the general, psychological, social relationships and environment domains have significant differences between students with high API and low API, that is, the only domain whose mean has no significant difference between students with high API and low API is the physical domain ( $p=0.980$ ).

In contrast to the human sciences, the exact and health sciences obtained a significant difference of means only in the psychological domain ( $p=0.021$ ) and environment ( $p=0.029$ ), respectively, among students with high API and low API. It is observed that, in all domains whose p-value reveals a significant statistical difference, the mean value of students with high API is higher than that of students with low API.

The results of the association between API and the questions of WHOQOL-BREF and the complementary questionnaire were analyzed by area of knowledge (human, exact and health sciences). Table III shows the results of Spearman's correlation test through its correlation coefficient ( $r$ ) and the level of significance ( $p$ ) of this correlation between the academic performance index (API) and the facets and questions in the WHOQOL-BREF questionnaire and the supplementary questionnaire, respectively.

The results found on the association between the API and the facets of the WHOQOL-BREF questionnaire are presented below.

In the Human area, there was a significant correlation between the API and the facets "F1: How would you rate your quality of life?" ( $p<0.01$ ), "F3: To what extent do you think your (physical) pain prevents you from doing what you need?" ( $p<0.05$ ) "F4: To what extent do you need some medical treatment to run your daily life?" ( $p<0.05$ ), "F6: To what extent do you think your life makes sense?" ( $p<0.05$ ), "F7: How much can you concentrate?" ( $p<0.01$ ), "F12: Do you have enough money to meet your needs?" ( $p<0.01$ ), "F13: How available to you is the information you need in your daily life?" ( $p<0.05$ ), "F17: How satisfied are you with your ability to perform your everyday activities?" ( $p<0.01$ ), "F18: How satisfied are you with your ability to work?" ( $p<0.01$ ), "F19: How satisfied are you with yourself?" ( $p<0.05$ ) and "F24: How satisfied are you with your access to health services?" ( $p<0.05$ ). Regarding the questions in the supplementary questionnaire, it was evidenced a significant correlation between the API of students in the human area and the questions "Q3: Where do you live?" ( $p<0.05$ ), "Q7: If you are a smoker, how many cigarettes do you smoke per day?" ( $p<0.01$ ) and "Q10: How would you rate your self-discipline, organization and planning of your study activities?" ( $p<0.01$ ).

Among these significant facets and questions, the majority presented a positive correlation ( $r>0$ ) with the

API. However, facets F3 and F4 of the WHOQOL-BREF questionnaire established a negative correlation ( $r<0$ ) with the API, as well as question Q3 and Q7 of the complementary questionnaire.

In the courses of exact sciences area, there was a significant correlation between the API and the facets "F7: How much can you concentrate?" ( $p<0.01$ ), "F19: How satisfied are you with yourself?" ( $p<0.05$ ), "F21: How satisfied are you with your sex life?" ( $p<0.05$ ). In the supplementary questionnaire, the questions that correlated significantly with these students' API are "Q2: How satisfied are you with your course?" ( $p<0.01$ ), "Q4: How much of your time per week do you actually use with optional activities?" ( $p<0.05$ ), "Q6: doze or sleep during the day, what is the average duration of your sleep during the day?" ( $p<0.05$ ), ( $p<0.01$ ), "Q10: How would you rate your self-discipline, organization and planning of your study activities?" ( $p<0.01$ ) "Q8: In a normal week, how many doses of alcohol do you drink?" All of these aspects presented a positive correlation ( $r>0$ ) with the API of students of exact-related courses, except for facet F21, Q6 and Q8, whose correlations with the API were negative ( $r<0$ ).

In the area of health-related courses, there was a significant correlation with API only in facets: "F3: To what extent do you think your (physical) pain prevents you from doing what you need?" ( $p<0.05$ ) and "F9: How healthy is your physical environment (climate, noise, pollution, attractions)?" ( $p<0.01$ ). Also in the supplementary questionnaire, only two questions correlated with the API of students in this area, questions "Q8: In a normal week, how many doses of alcoholic beverages do you drink?" ( $p<0.05$ ), "Q10: How do you rate your self-discipline, organization and planning of your study activities?" ( $p<0.01$ ).

Students of the health sciences area had F9 and Q10 positively correlated with the API ( $r>0$ ), while F3 and Q8 were negatively correlated with API ( $r<0$ ).

In spite of these mentioned facets and questions, whose correlation was statistically significant with API ( $p<0.05$ ), most of them (26 facets and 9 questions) had a weak magnitude of correlation ( $|r| \leq 0.3$ ), except for the question "Q10: How would you rate your self-discipline, organization, and planning of your study activities?" of the complementary questionnaire, which showed a moderate magnitude of correlation ( $|r| > 0.3$ ) for both human and exact sciences. In the health sciences area, this question had a weak correlation with API, although significant.

## DISCUSSION

It is worth mentioning that, when studying the relationship between quality of life and academic

performance of university students of different areas, a greater number of associations of such variables is observed in the analysis of the courses separately, indicating the existence of specificities among the courses in aspects of QOL<sup>(7)</sup>. Thus, to demarcate such peculiarities of the university courses, the present study discussed their results by area of education (human, exact and health sciences).

From the results of the present study, it was observed that the human sciences area has the highest values of API mean and median, followed by the values of the health area. In the human sciences, the general, psychological, social relationships and environment domains have significant association with the API, being the physical domain the only one without significant difference.

When specifying the aspects that influence the API, it was noticed, in this area, there was significance between the API and the questions of the complementary questionnaire addressing the type of student housing, tobacco use, and self-assessment of the discipline, organization and planning of the study activities. These results were weighted together with data from the literature, in general, as described below.

Surprisingly, question Q3 of the supplementary questionnaire had a negative correlation with the API, being evidenced in the present study that living in a rooming house or with the family poses disadvantages to the student's academic performance, when compared to students living in student boarding facilities or by themselves. This goes against what is usually found in the literature<sup>(7)</sup>, in which students who live off-campus view housing as costly and space-limited, which culminates in negative effects from the academic point of view, leading these students to obtain a worse performance than those who live with their parents.

Question Q7 also had a negative correlation with the API in the current study, showing that the higher the daily consumption of cigarettes, the lower the student's API. In this context, an investigation<sup>(15)</sup> evaluating the prevalence of risk behaviors among university students concluded that 19.9% are smokers and 33.1% drink alcoholic beverages; moreover, it was found that 40.4% of the students do not practice physical exercise. The presence of low income and low levels of education are pointed as predisposing factors for tobacco consumption and physical inactivity<sup>(16)</sup>. The adoption or maintenance of healthy lifestyles represents a hurdle for most students, even though a minority claims that it interferes with academic achievement; tobacco is the drug with which students report having more difficulties compared to other substances, such as alcohol, hashish and others<sup>(15)</sup>. Other studies<sup>(11)</sup> show that, with the entrance into higher education, the consumption of psychoactive substances such as tobacco increases, a situation that deserves attention when it comes to institutional public policies.

Literature data<sup>(15)</sup> also show that students perceive stress and anxiety, associated with time management, social distractions, and family responsibilities, as major problems, interfering with academic performance. This supports the results of the present study, with positive and significant correlation ( $p < 0.01$ ) shown between the API and aspects related to well-being, feelings, and management of functions and time (F1, F17, F18, F19, and Q10).

Still in the physical domain, in the present investigation there was a significant correlation ( $p < 0.01$ ) of API with physical pain as a hindrance to the performance of daily activities, and with dependence on medication or medical treatments. These results corroborate other investigations, which also found alterations of the physical domain in university students. A study conducted in the United Kingdom and Egypt<sup>(17)</sup> points out fatigue, headaches, and back pain as complaints frequently reported by the students. Furthermore, headache is indicated as an interfering factor in academic achievement/university adaptation<sup>(6)</sup>. Another study<sup>(7)</sup> with students at the University of Minho - Portugal also reveals a correlation between academic performance and physical well-being in social and human sciences courses.

Self-medication sees a statistically significant increase with admission to higher education, although this variation does not translate into a negative change in the health of a large number of students, due to the reported low frequency of use<sup>(11)</sup>. On the other hand, it is known that psychological health is influenced by the binomial quality of sleep and physical exercise<sup>(18)</sup>, while physical fitness has a positive relation with the academic performance of schoolchildren<sup>(19)</sup>, but the physical/sports activities profile decreases with admission to higher education<sup>(11)</sup>, thus compromising the physical domain of QOL.

The present study also showed a significant correlation ( $p < 0.01$ ) between API and satisfaction with the ability to perform activities and work. In the literature, studies demonstrate the relationship between these variables<sup>(20)</sup>, rendering evident a poor academic performance on the part of the student who works. This is due to insufficient time of study, fatigue, discouragement, lack of sleep, and excessive social and/or family commitments. On the performance of activities, physical indisposition and fatigue hinder the daily activities and studies<sup>(20)</sup>. By examining pedagogy students' habits, another study<sup>(21)</sup> notes a clear difficulty for students in reconciling work, study, family, and extraclass activities.

As for the psychological domain, the present study obtained a significant correlation of the API with the questions that addressed positive feelings and the capacity of concentration. This result is of considerable importance because, as the literature reveals<sup>(2)</sup>, university students are not completely satisfied with their personal condition of life,

especially when it comes to experiencing negative feelings and their ability to concentrate. The excessive workload for the student-worker is also identified as one of the situations that do not promote QOL.

In a similar study<sup>(7)</sup>, while the question addressing the “sense of one’s own life” is positively evaluated by university students, the question on ability to concentrate is the most compromised item among the psychological questions. Thus, the author demonstrates coherent concern due to the need of such condition for the learning process to occur. Additionally, he calls attention to the whole adaptation, on the part of the student, to the new academic conditions, which may interfere with both academic achievement and QOL. This adaptation depends on changes of interest, values, maturity, aptitudes, needs and personality traits that may occur.

On the other hand, anguish and sadness do not seem to be problematic in the opinion of the students, most of whom say that these types of feelings do not significantly interfere with their academic performance<sup>(15)</sup>.

The present study also showed a statistically significant relationship ( $p < 0.01$ ) between API and self-satisfaction. Corroborating this fact, a recent research<sup>(22)</sup> with university students shows that participants with higher self-esteem, confidence and less fear of failure have better average scores. Contrarily, other studies<sup>(2)</sup> point out that, even in the face of academic failure, students manage to protect their self-esteem and that, despite a low self-esteem, the academic achievement remains high.

In the context of the environment domain, there was a significant correlation ( $p < 0.01$ ) of API with the availability of financial resources in the present study. Socioeconomic characteristics influence the time available for study, internship and leisure, which will substantially modify the student’s dedication to the course, as well as to internships, parallel courses and congresses, thus leading to less favorable learning conditions<sup>(7)</sup>.

Also regarding the environment domain, the API had a significant correlation ( $p < 0.01$ ) with the questions regarding the availability of necessary information and access to health services in the current study. As for the availability of information, the deficient pedagogical qualification of many teachers, omissions in bibliographic collections, precarious access to new information and communication technologies in the university space have a direct impact on students’ performance<sup>(18)</sup>. With respect to health services, the importance of intervening in the university context is highlighted<sup>(15)</sup>, regarding the provision of psychological support services and activities for health promotion, in a preventive perspective, with the objective of responding to

the needs expressed by the students, thus contributing to the success of their integrality and academic performance.

In the area of exact sciences, only the psychological domain had a significant correlation with the students’ API ( $p < 0.01$ ) in the current research, a fact that draws attention, since most of the engineering students rated themselves as stressed out, emphasizing that a minor social support is associated with more stress and prediction of depressive symptoms in first-year college students<sup>(23)</sup>. Stressors can be divided into physical stressors, which interfere with the individual’s body, cognitive stressors, which are related to tests, contests and discussions, and emotional stressors, which involve feelings of fear, changes and loss<sup>(5)</sup>.

On the prevalence of psychiatric disorders in college students, a substantial prevalence of social phobia has been found, with significant negative effects on the QOL, with higher risk of developing the disorder found in women living in urban areas and students with a family history of psychiatric disease<sup>(24)</sup>. It is also worth noting that the practice of self-medication among students of higher education is extremely prevalent, with higher rates among students of administration and civil engineering<sup>(25)</sup>.

The facets of the psychological domain that comprise positive feelings, such as thinking, learning, memory and concentration; self esteem; body image and appearance, were significantly correlated with the API ( $p < 0.01$ ) in the research in question, showing that optimism and self-esteem are positively related to life satisfaction and subjective well-being, which are predictors of academic performance<sup>(26)</sup>. At the same time, rational coping strategies, with problem solving, reduce stress and may contribute to improve the academic performance<sup>(27)</sup>.

Unlike the other two areas, in the current study, facet F21 of the WHOQOL bref questionnaire, which belongs to the domain social relationships and encompasses satisfaction with sexual life, had a significant negative correlation with the API of exact sciences students ( $p < 0.01$ ), in contrast with the literature, which indicates that the better the social relationships, the better the academic performance<sup>(28)</sup>, although a conservative behavior of maintaining virginity has already been positively related to the academic performance of the female gender<sup>(7)</sup>.

In the complementary questionnaire, the present study revealed a significant positive correlation of API ( $p < 0.01$ ) with questions about self-discipline, organization and planning; the time spent with extracurricular activities; and how satisfied the student is with the course. These results corroborate that student’s efficacy in study-related skills and behaviors may play an important role in maintaining pleasant learning-related emotions and, consequently, better academic performance<sup>(29)</sup>. On the other hand, questions

Q6 and Q8, respectively related to diurnal sleep time and alcohol consumption, had a significant negative correlation with the API ( $p < 0.01$ ), denoting that the higher the alcohol consumption<sup>(15)</sup> or the worse the sleep quality of the student, the lower their academic performance<sup>(30)</sup>, since the duration of sleep and eating habits are among the main factors for QOL improvement<sup>(31)</sup>.

As regards the health area, in the present study only the environment domain had a significant relationship ( $p < 0.01$ ) with the difference between the averages of students with high API and low API, with emphasis on facet F9 of the WHOQOL-BREF questionnaire, which addresses how healthy the student's physical environment is. These findings corroborate other studies<sup>(32,28)</sup>, which evidence that the physical environment within the classroom has an important and positive impact on students' academic performance and QOL. Given that, it is emphasized that "the environmental conditions are important for the understanding of changes that occur with the students, because the physical environment (whether natural or man-made) shapes the behavior, allowing certain types of activities, while limiting or rendering others impossible"<sup>(7)</sup>.

Even though the API did not correlate significantly with the WHOQOL-BREF psychological domain in the current study, it is known that longer hours of study are related to lower psychological health<sup>(33)</sup>; in addition, in the complementary questionnaire applied in the present study, questions related to alcohol consumption and to self-discipline, organization and planning of study that fit within the psychological scope were variables that had a significant association with the value of academic performance ( $p < 0.01$ ), similarly to the literature, which demonstrates that high academic performance correlates positively with physical and psychological health, social relationships and environment<sup>(28)</sup>.

Other studies emphasize that "aspects of training can cause negative effects on the mental and emotional health of the students"<sup>(34)</sup>, since their quality of life decreases in all four domains as their level of education increases<sup>(32)</sup>.

It is noteworthy that ethical conflicts, evaluation systems, curriculum concerns and exposure to suffering and death are some of the aspects that contribute to anxiety, depression, sleep deprivation and stress<sup>(34)</sup>. In result, there is an increase in substance abuse, difficulties in relationships, suicides, low academic performance, and even contribution to medical errors<sup>(34,35)</sup>. Therefore, students believe that having a religious belief helps them cope with the learning environment, although this association with academic performance has not been evidenced<sup>(33)</sup>.

Abuse of alcoholic beverages and illicit drugs are issues of great concern, since the students admit excessive use of these substances as a way to alleviate the pressure they

feel, stress due to exams, work and anxiety<sup>(34)</sup>. It is noted that the regular consumption of illicit drugs is less likely to occur among students with high health awareness and living with their parents but, surprisingly, this consumption has been higher among university students reporting good academic performance; thus confronting the association between illicit drugs and worse student performance<sup>(36)</sup>, since the negative association between school performance and alcohol consumption is known, proportionally to the amount and time of consumption and intoxication<sup>(15,36)</sup>.

With regard to the organization, self-discipline and study planning, it is evident that one of the reasons for the difficulty faced by the students in adapting to the University derives from the adoption of a deficient work methodology<sup>(37)</sup> and learning approaches adopted by the institutions, when discordant of the individual study style of each student<sup>(38)</sup>. Consequently, learning-related problems and poor performance arise<sup>(37)</sup>, also related to the lack of individual motivations that impel the active search for new knowledge and skills<sup>(37)</sup>. It is observed a correlation between the organization of the study (daily management of time, materials and methods) and academic performance<sup>(37)</sup>, although it has been shown that student skills may be more important for academic achievement and QOL than the study time by itself<sup>(39)</sup>, since the involvement with extracurricular activities may contribute to academic success<sup>(37)</sup>.

Although the present study did not demonstrate statistical significance between the physical domain, in general, and the API, the question of the WHOQOL-BREF questionnaire addressing physical pain has shown its influence on the academic performance, confirming that the aggravations of health problems, especially pain, are negatively correlated with this index<sup>(7)</sup>. However, the student's physical disability, pain, and health status may cause more problems in relation to school dropout than academic performance problems, since the students stop attending classes in order to seek medical care<sup>(37)</sup>. However, the negative impact of sleep deprivation (physical domain) on academic performance and mood is a consensus among students, with a demand for advice on healthy sleep patterns, beyond the curricular education<sup>(35)</sup>.

It is worth mentioning that, although the WHOQOL questionnaire is one of the instruments most used in studies related to the measurement of quality of life<sup>(40)</sup>, it is limited by the fact that it is a self-report instrument. Another limitation of the present study is the complexity of evaluating the actual academic performance of the university student, given that, similarly to the quality of life, a student's performance is influenced by a variety of factors.

However, a direct relationship between the academic performance and the QOL of university students is clearly

identified<sup>(28)</sup>. Therefore, promoting health/well-being and improving life satisfaction can favor good QOL, as well as the social and academic performance of university students<sup>(9,10,20,27)</sup>.

## CONCLUSION

It can be seen in the present research that the area of human sciences presented the best average API values for both the academic achievement and the majority of quality of life domains. This area had the API associated with four out of the five domains, differently from the exact and the health sciences, which had a significant association of API with only one domain: the psychological health and the environment, respectively.

The area of human sciences was the one whose API was associated with a greater number of QOL facets - fourteen associations, in total - involving aspects such as health, financial issues, performance and feelings. Regarding the exact sciences, eight aspects associated with API were evidenced, namely being satisfaction with the course, with oneself and with the sexual life, capacity of concentration, self-discipline, time spent with optional activities and with daytime sleep, in addition to the consumption of alcohol and tobacco. The API of health students was associated with only four QOL aspects, related to more specific issues: physical environment, self-discipline, alcohol, and physical pain.

It was evidenced that the only common aspect among the three areas analyzed was the fact that the API was significantly associated with the self-rating of self-discipline, organization and planning of study activities, mainly among the students of human and exact sciences, in which this association was stronger.

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