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Article

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Assessment of the quality of life of university students during the COVID-19 pandemic

Avaliação da qualidade de vida de estudantes universitários durante a pandemia da COVID-19

Evaluación de la calidad de vida de los estudiantes universitários durante la pandemia de COVID-19

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Abstract: Several studies have shown COVID-19 has affected the mental health and quality of life of students. This study aimed to assess the quality of life of students in two Brazilian public universities in 2020, using a cross-sectional study. The profile of the participants was delineated from a sociodemographic questionnaire, and the quality of life was assessed by the WHOQOL-*bref*. A total of 144 students were assessed, in which most of them were under 23 (57%), female (78%), self-declared brown (46%) and without a partner (87%). Most of them declared to sleep less than 8 hours a day, considered their quality of life to be good, and were satisfied with their health. The social relationships domain had the highest average, followed by the environment, physical and psychological domains. The perception of the student's quality of life was considered good, and the factors associated were sex, family income, and number of sleeping hours.

Keywords: quality of life; university student; COVID-19.

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Resumo: Diversos estudos têm demonstrado que a pandemia do COVID-19 tem prejudicado a saúde mental e a qualidade de vida dos estudantes. Assim, o objetivo deste estudo foi avaliar a qualidade de vida dos estudantes em duas universidades públicas brasileiras em 2020, utilizando um estudo transversal. O perfil dos participantes foi delineado a partir de um questionário sociodemográfico e a qualidade de vida foi avaliada pelo WHOQOL-*bref*. Um total de 144 estudantes participaram, sendo a maioria com idade inferior a 23 anos (57%), do sexo feminino (78%), autodeclarada pardos (46%) e sem companheiro(a) (87%). A maioria declarou dormir menos de 8 horas/dia, considerou sua qualidade de vida como sendo boa e estavam satisfeitos com a sua saúde. O domínio relações sociais teve maior média, seguido pelos domínios meio ambiente, físico e psicológico. A percepção sobre a qualidade de vida dos estudantes foi considerada boa e os principais fatores associados foram sexo, renda familiar e número de horas dormidas.

Palavras-chave: qualidade de vida; estudante universitário; COVID-19.

Resumen: La salud mental y la calidad de vida de los estudiantes se vieron perjudicadas por los efectos de la pandemia de COVID-19. El objetivo de este estudio es evaluar la calidad de vida de los estudiantes universitarios durante la pandemia. Se trata de un estudio transversal realizado en das universidades públicas brasileñas en 2020. La información se recolectó, mediante la utilización de dos cuestionarios: cuestionario sociodemográfico y WHOQOL-bref. Participaron un total de 144 estudiantes, la mayoría menores de 23 años (57%), mujeres (78%), autodeclaradas morenas (46%) y sin pareja (87%). La mayoría declaró dormir menos de 8 horas diarias, consideró buena su calidad de vida y se mostró satisfecha con su salud. El dominio de las relaciones sociales tuvo el mayor promedio, seguido por los dominios medio ambiente, físico y psicológico. La percepción de la calidad de vida de los estudiantes fue considerada buena y los factores asociados a esta percepción fueron el género, la renta familiar y el número de horas dormidas.

Palavras clave: calidad de vida; estudiante universitario; COVID-19.

1 Introduction

The novel coronavirus, which causes the disease known as COVID-19, was first identified in China at the end of 2019. On March 11, 2020, the World Health Organization (WHO) declared the disease a pandemic (WHO, 2020). As the disease was previously unknown, with no established treatment protocol or preventive vaccine, countries implemented strict social isolation measures to control the spread of the disease (Wilder-Smith; Freedman, 2020).

A lack of social contact, fear of infection, fear of death, inaccurate information about the disease, and the unpredictability of the end of quarantine have been identified as risk factors for the development of emotional disorders and impaired quality of life (QoL) (Le-ong Bin Abdullah *et al.*, 2021; Silva *et al.*, 2021; Ornell *et al.*, 2020).

In addition to the aforementioned factors, the abrupt suspension of face-to-face classes, lack of access to the university, disruption of contact with classmates and teachers, and uncertainty about returning to classes represent further challenges in the academic context (Leong Bin Abdullah *et al.*, 2021; Silva *et al.*, 2021; Chang; Yuan; Wang, 2020; Wilder-Smith; Freedman, 2020).

Studies conducted in India (Balhara *et al.*, 2020), the USA (Mechili *et al.*, 2020), and Greece (Kaparounaki *et al.*, 2020) have identified a prevalence of depressive symptoms among university students during the pandemic. In the USA, there was also an increase in symptoms of depression, anxiety, loneliness, and alcohol abuse among participants aged between 18 and 35 (Horigian; Schmidt; Feaster, 2020).

The detrimental impact of the pandemic on the mental health and quality of life (QoL) of university students has also been documented in studies conducted in Spain (Odriozola-González *et al.*, 2020), France (Wathelet *et al.*, 2020), Colombia (Pedrozo-Pupo; Pedrozo-Cortés; Campo-Arias, In 2020, studies were conducted in the United States (Son *et al.*, 2020), Malaysia (Leong Bin Abdullah *et al.*, 2021), China (Cai *et al.*, 2021), Jordan (Almhdawi *et al.*, 2021), and Norway (Beisland *et al.*, 2021).

A study conducted with Brazilian university students revealed the impact of the COVID-19 pandemic on self-perceived mental health and an increase in symptoms of depression, stress, and quality of life (Cortes; Pinho; Passos, 2023; Santos *et al.*, 2022). Furthermore, Brazil was identified as one of the countries with the highest rates of mental health impairment in a survey conducted by CHEGG in 2021 (CHEGG.Org, 2021).

It is widely recognized that quality of life (QoL) influences the ability to concentrate, sleep, and have energy, which in turn directly interferes with the learning and training process of university students (Souza *et al.*, 2021; Oliveira *et al.*, 2020; Son *et al.*, 2020). Given that studies have indicated a decrease in the quality of life (QoL) of the population during the pandemic, the aim of this study was to assess the QoL and associated factors of university students during this period.

2 Methods

This study employed a cross-sectional design, conducted at two Brazilian public universities in the state of Goiás. The selection of the universities was based on the researchers' participation as members of their teaching staff. It is estimated that the two universities together have a total of 8,600 students enrolled in undergraduate courses (UFG, 2022; UFJ, 2022).

In light of the suspension of face-to-face classes and in accordance with the General Law on the Protection of Personal Data (Brazil, 2018), the Undergraduate Dean's Office of the two universities assumed the responsibility of sending an invitation to participate in the survey by email to all students enrolled in undergraduate courses. The invitation was sent between September 4 and November 3, 2020, six months after the World Health Organization (WHO) declared the novel Coronavirus (COVID-19) pandemic. Along with the invitation, the Informed Consent Form (ICF) was sent, which had been adapted for the online version. This form included information regarding the privacy of identification and confidentiality of data. Additionally, students had the option of withdrawing their consent at any time, without this affecting their academic training.

By agreeing to participate in the survey, the student had access to the sociodemographic questionnaire and the WHOQOL-bref QoL questionnaire, both of which were adapted for the online version. To prevent duplicate responses from the same individual, the "limit answers to once per person" function was activated.

A total of 146 students responded to the survey. Two participants were excluded from the sample due to failing to answer six or more questions on the QoL assessment instrument (Pedroso *et al.*, 2010; WHOQOL GROUP, 2012). Thus, 144 students participated in the study, all aged over 18, of both sexes, and from different undergraduate courses.

3 Data collection

A sociodemographic questionnaire was used to identify the profile of the participants, including data such as age, gender, self-declared skin color, marital status, family income, higher education institution and number of hours slept per night.

The WHOQOL-bref was used to assess quality of life. This instrument is self-administered and consists of 26 questions. The first two questions refer to self-perception of QoL and health and the other questions address QoL in four domains (physical, psychological, social relationships and environment). This instrument was developed by the WHO and translated and validated in Brazil. Each question is scored on a 5-point Likert scale, ranging from 1 (not at all/very, bad/never) to 5 (ex-tremely/completely/very good/always) (WHOQOL GROUP, 2012; Fleck *et al.*, 1999).

The WHOQOL-bref was analyzed using the online tool developed by Pedroso *et al.* (2010) following the correction criteria established by the WHOQOL Group (Fleck *et*

al., 1999). This tool automates color calculations and descriptive statistics. It is compatible with different versions of Microsoft Office software (2000, XP, 2003 and 2007) and can be downloaded from http://www.brunopedroso.com.br/whoqol-bref.html (Pedroso *et al.*, 2010).

4 Statistical analysis

The information from the sociodemographic questionnaire and the WHOQOL-bref was organized in an Excel spreadsheet (Microsoft Office Excel® 2010) and then transferred to the statistical software Stata version 12.0®.

Categorical variables were presented as absolute and relative frequencies, and the normality test (Shapiro-Wilk) was applied to numerical variables. Normal variables were described in terms of mean and standard deviation and non-normal variables in terms of medians and interquartile ranges.

The WHOQOL-bref domains were compared by selected variables using the Student's t-test. Bivariate and multivariate regression analyses were used to examine the association between the selected variables and the WHOQOL-bref domains. In the multivariate regression analysis, potential adjustment variables were selected (university, age, gender, skin color, marital status, family income and number of hours slept) with a statistical significance of 20% (p-value <0.20).

5 Ethical Statement

The research was approved by the Research Ethics Committee under n^0. CAAE 31942620.5.0000.5083.

5.1 Results

The study included 144 students, 82 (56.94%) of whom resided in the same city as the HEI. The majority of these students were enrolled at HEI 2. The participants were under the age of 23 (56.9%), female (77.8%), self-reported as having brown skin color (45.8%), living without a partner (87.5%), and with a family income above four minimum wages (51.4%), as shown in Table 1.

Table 1 - Characteristics of academics at federal public institutions in the state of Goiás, Brazil, in the 2020/2021 academic year (n=144)

CATEGORICAL VARIABLES	N (%)
Higher Education Institution	
IES 1	62 (43,1)
IES 2	82 (56,9)
City of residence	
In the same city as the HEI	82 (56,9)
In another city	62 (43,1)
Age (years)	
< 23	82 (56,9)
≥ 23	62 (43,1)
Gender	
Male	32 (22,2)
Female	112 (77,8)
Skin color	
White	57 (39,6)
Brown	66 (45,8)
Yellow	16 (11,1)
Black	4 (2,8)
Indigenous	1 (0,7)
Marital status	
With partner	18 (12,5)
Without partner	126 (87,5)
Family income	
≤ 4 minimum salaries	70 (48,6)
> 4 minimum salaries	74 (51,4)
Number of Hours Slept	
< 8 hours per night	78 (54,17)
≥ 8 hours per night	66 (45,83)

HEI 1: Higher Education Institution 1. HEI2: Higher Education Institution 2. Absolute and relative frequencies presented as: N (%).

The majority of students (44.4%) rated their quality of life (QoL) as "good," while 31.9% rated it as "neither bad nor good," 15.9% rated it as "very good," 6.9% rated it as "bad," and 0.7% rated it as "very bad." With regard to self-perception of health, the majority of students (38.2%) were satisfied with their own health, 31.6% were neither dissatisfied nor satisfied, 16.7% were dissatisfied, 9.7% were very satisfied, and 3.4% were very dissatisfied.

In terms of the WHOQOL-BREF domains, the domain of social relationships exhibited the highest mean score (13.5 ± 3.9), followed by the environmental domain (13.15 ± 3.01), the physical domain (12.77 ± 2.54), and the psychological domain (12.73 ± 2.54).

A comparative analysis was conducted between the scores for General/Total QoL and the WHOQOL-bref domains with each of the sociodemographic variables (HEI, age, gender, self-reported skin color, marital status, family income, and number of hours slept). The results demonstrated that less than 8 hours of sleep significantly reduced the score for all domains when compared to those who slept 8 hours or more (Table 2).

The number of hours slept and age were found to be associated with overall quality of life (QoL; Table 3). The physical domain was associated with Healthy Eating Index (HEI) and family income; the psychological domain was associated with the number of hours slept, age, gender, and marital status; the environmental domain was associated with the number of hours slept, age, marital status, and family income; and there was no association between the variables and the social relations domain.

6 Discussion

This study aimed to investigate the quality of life (QoL) and associated factors of university students from two public universities in the state of Goiás during the period of social isolation caused by the COVID-19 pandemic.

The majority of participating students were from HEI 2, resided in the same city as the HEI, were under the age of 23, were female, lived without a partner, and had a family income of over four minimum wages. The majority of respondents perceived their quality of life to be satisfactory and expressed satisfaction with their health. These findings align with those of previous studies conducted in Brazil during the pandemic (Vilanova-Campelo *et al.*, 2021; Silva, 2021; Ramos *et al.*, 2020).

In our study, students exhibited higher scores in the social relationships domain, indicating that they received support and social support during the pandemic. The social relationships domain encompasses social support, as defined by the WHOQOL Group (2012). This result is consistent with the findings of previous studies by Silva (2021), Leite *et al.* (2020), and Ramos *et al.* (2020)

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Table 2 - Evaluation of the WHOQOL-bref domains according to the number of hours slept and sociodemographic data of academics from federal public institutions in the state of Goiás Brazil 2020/2021 (n=144)

	VARIABLES	General/Total QoL Mean and SD	Physical Domain Mean and SD	Psychological Domain Mean and SD	Social Relationships Domain Mean and SD	Environment Domain Mean and SD
Number of Hours Slept	< 8 hours (n=78)	12,56 (0,25)	12,42 (0,24)	12,16 (0,33)	12,92 (0,47)	12,58 (0,33)
	≥ 8 hours (n=66)	13,65 (0,27)	13,18 (0,35)	13,41 (0,29)	14,14 (0,45)	13,82 (0,36)
	p-value	**0,002**	**0,037**	**0,003**	**0,032**	**0,006**
Higher Education Institution	IES 1 (n= 62)	13,27 (0,30)	13,57 (0,34)	12,63 (0,37)	13,07 (0,46)	13,24 (0,38)
	IES 2 (n=82)	12,90 (0,23)	12,15 (0,25)	12,80 (0,29)	13,79 (0,46)	13,08 (0,34)
	p-value	0,838	**<0,001**	0,357	0,141	0,379
Age (years)	< 23 (n=82)	13,55 (2,09)	13,04 (2,58)	13,17 (2,49)	13,97 (3,67)	13,93 (2,79)
	≥ 23 (n=62)	12,40 (2,28)	12,42 (2,45)	12,15 (2,99)	12,84 (4,20)	12,12 (2,98)
	p-value	**0,001**	0,080	**0,014**	**0,044**	**<0,001**
Gender	Male (n=32)	13,58 (0,44)	13,18 (0,38)	13,71 (0,55)	13,67 (0,74)	13,47 (0,64)
	Female (n=112)	12,91 (0,20)	12,65 (0,25)	12,45 (0,24)	13,43 (0,37)	13,06 (0,27)
	p-value	0,067	0,149	**0,011**	0,388	0,251
Marital status	Without partner (n=126)	13,25 (0,20)	12,84 (0,22)	12,91 (0,24)	13,51 (0,35)	13,51 (0,26)
	With partner (a) (n=18)	11,73 (0,49)	12,25 (0,63)	11,48 (0,66)	13,26 (0,98)	10,31 (0,56)

	p-value	**0,003**	0,181	**0,020**	0,399	**<0,001**
Family Income	1 to 3 salaries (n=70)	12,61 (0,25)	12,14 (0,25)	12,65 (0,33)	13,87 (0,50)	12,33 (0,34)
	4 or more salaries (n=74)	13,48 (0,26)	13,36 (0,32)	12,81 (0,32)	13,12 (0,42)	13,92 (0,34)
	p-value	**0,009**	**0,002**	0,362	0,127	**<0,001**

Note: HEI 1: Higher Education Institution 1. HEI 2: Higher Education Institution 2.

Absolute frequencies presented as: N.

SD: standard deviation

p-value refers: Unpaired Student's t-test, considering $p<0.05$ for statistical significance (in bold)

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Table 3 - Association between sociodemographic characteristics and the WHOQOL- bref domains of academics at federal public institutions in the state of Goiás, Brazil 2020/2021 (n=144)

	Global/Total		Physical Domain		Psychological Domain		Social Relationships Domain		Environment Domain	
	β 1 (95% IC)	*p-value* 1	β 1 (95% IC)	*p-value* 1	β 1 (95% IC)	*p-value* 1	β 1 (95% IC)	*p-value* 1	β 1 (95% IC)	*p-value* 1
Number of Hours Slept (< 8hours/≥8hours)	1,094 (0,373; 1,816)	**0.003**	0,760 (-0,073; 1,591)	0.073	1,241 (0,350; 2,131)	**0,007**	1,218 (-0,0707; 2,508)	0,064	1,242 (0,267; 2,218)	**0,013**
IES (IES 1/IES 2)	-0,373 (-1,120; 0,373)	0.324	-1,422 (-2,235; -0,608)	**0.001**	0,170 (-0,750; 1,089)	0,715	0,714 (-0,594; 2,022)	0,283	-0,156 (-1,160; 0,847)	0,758
Age (years) (<23/≥23)	-1,155 (-1,880; -0,432)	**0.002**	-0,600 (-1,441; 0,241)	0.161	-1,020 (-1,924; -0,115)	**0,027**	-1,128 (-2,428; 0,171)	0,088	-1,812 (-2,769; -0,854)	**0,000**
Gender (male/ female)	-0,674 (-1,560; -0,210)	0.134	-0,531 (-1,535; 0,474)	0.298	-1,255 (-2,331; -0,180)	**0,023**	-0,239 (-1,802; 1,325)	0,763	-0,406 (-1,560; 0,787)	0,502
Marital status with/without partner	-1,511 (-2,604; -0,419)	**0.007**	-0,585 (-1,849; 0,679)	0.362	-1,428 (-2,785; -0,719)	**0,039**	-0,254 (-2,219; 1,712)	0,799	-2,90 (-4,328; -1,481)	**0,000**
Family Income (≤4/>4 minimun salaries)	0,878 (0,151; 1,605)	**0.018**	1,220 (0,405; 2,034)	**0.004**	0,163 (-0,748; 1,074)	0,724	-0,750 (-2,045; 0,545)	0,254	1,590 (0,631; 2,548)	**0,001**

Note: HEI 1: Higher Education Institution 1. HEI2: Higher Education Institution 2.

95% CI: 95% confidence interval

β: regression coefficient, where β 1 is bivariate regression and β 2 is multivariate linear regression.

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Table 3 - Association between sociodemographic characteristics and the WHOQOL- bref domains of academics at federal public institutions in the state of Goiás, Brazil 2020/2021 (n=144) (continued)

	Global/Total		Physical Domain		Psychological Domain		Social Relationships Domain		Environment Domain	
	β 2 (95% IC)	*p-value 2*	β 2 (95% IC)	*p-value 2*	β 2 (95% IC)	*p-value 2*	β 2 (95% IC)	*p-value 2*	β 2 (95% IC)	*p-value 2*
Número de horas dormidas (< 8horas/≥8horas)	0,829 (0,128; 1,531)	0,021	0,641 (-0,174; 1,457)	0,122	1,027 (0,140; 1,915)	**0,024**	1,144 (-0,172; 2,460)	0,088	0,736 (-0,156; 1,628)	0,105
IES (IES 1/IES 2)	0,767 (-0,923; 1,077)	0,88	-1,374 (-2,537; -0,211)	**0,021**	0,134 (-1,132; 1,400)	0,835	-0,055 (-1,931; 1,822)	0,954	1,376 (0,104; 2,648)	**0,034**
Idade (anos) (<23/≥23)	-0,771 (-1,523; -0,019)	**0,045**	-0,525 (-1,400; 0,345)	0,237	-0,742 (-1,694; 0,210)	0,126	-1,202 (-2,614; 0,208)	0,094	-0,906 (-1,863; 0,502)	0,063
Sexo (masculino/ feminino)	-0,744 (-1,573; 0,839)	0,078	-0,615 (-1,578; 0,348)	0,209	-1,306 (-2,355; -0,257)	**0,015**	-0,315 (-1,869; 1,239)	0,69	-0,478 (-1,532; 0,575)	0,371
Situação Conjugal (com/sem companheiro/a)	-1,014 (-2,113; 0,085)	0,07	-0,416 (-1,694; 0,862)	0,521	-0,863 (-2,254; 0,528)	0,222	0,575 (-1,487; 2,637)	0,582	-2,256 (-3,654; -0,859)	**0,002**
Renda Familiar (≤4/>4 salários mínimos)	0,831 (-0,164; 1,825)	0,101	0,182 (-0,974; 1,339)	0,756	0,151 (-1,108; 1,410)	0,812	-0,992 (-2,858; 0,874)	0,295	2,465 (1,200; 3,730)	**0,000**

Note: HEI 1: Higher Education Note: Institution 1. HEI2: Higher Education Institution 2.

95% CI: 95% confidence interval

β: regression coefficient, where β 1 is bivariate regression and β 2 is multivariate linear regression.

In the context of stringent social isolation measures aimed at curbing the spread of the disease, the findings of the Cheah *et al.* (2021) and Clemente and Stoppa (2020) studies offer a potential explanation for these results. In these studies, participants employed technology (video phone calls, participation in musical lives, and scientific events conducted remotely) as a means of maintaining social contact with friends, family, and the community.

Another factor that may have influenced the score in the social relations domain is the return of students who relocated to their hometowns during the pandemic. This may have provided them with the opportunity to receive social and emotional support from their loved ones (Alomar; Palaian; Shanableh, 2021; Leite *et al.*, 2020).

The environmental domain encompasses the individual's perception of physical safety and protection, the physical environment, financial resources, transportation, the availability and quality of health and social care, opportunities to acquire new information and skills, and participation in recreation and leisure (WHOQOL GROUP, 2012). Consequently, the students' return to their parents' home, which provides a secure and safe environment conducive to receiving essential healthcare, may have contributed to a favorable score in the environmental domain.

The domain with the lowest score was psychological. This domain encompasses a range of positive and negative feelings, thoughts, learning, memory and concentration, self-esteem, body image and appearance, spirituality/religion/personal beliefs (WHOQOL GROUP, 2012). A similar low score was observed in the study by Santos *et al.* (2022), which highlighted the emergence of negative thoughts due to social isolation, fear of being infected, dying, or losing loved ones. These factors are accompanied by anxiety, hopelessness, anger, and a feeling of helplessness, which can contribute to low scores in this domain (Meister *et al.*, 2023).

The variable "number of hours slept" was found to be associated with all the QoL domains. The challenge of effectively managing study time alongside other daily activities became more pronounced. The time spent on social media, movies, and television shows increased, while academic activities were no longer a priority. This resulted in a decline in sleep quality, with some students experiencing insomnia, while others exhibited excessive sleep (Duong *et al.*, 2023). Poor sleep quality has been identified as one of the factors negatively impacting students' quality of life (QoL) in studies conducted in Turkey (Yavuz; Kugu, 2022), China (Zhang *et al.*, 2022) and Spain (Ramón-Arbués *et al.*, 2022). Furthermore, poor sleep quality is associated with stress (Alotaibi *et al.*, 2020), mood swings (Short *et al.*, 2020), and lower academic performance (Al Shammari *et al.*, 2020).

7 Conclusion

In this study, the psychological domain exhibited the lowest score. It can be surmised that this is attributable to the fact that we are currently experiencing a pandemic period during which social interaction has been restricted, information about the disease is limited, and infection and mortality rates are high (Silva *et al.*, 2021). It was observed that there was an association between the sociodemographic variables selected and QoL, particularly in relation to the variable number of hours slept.

It is important to note that the majority of students who participated in this study reside in households with an income of more than four times the minimum wage, which may not be representative of other income groups.

In light of the increased prevalence of mental disorders during the pandemic, scholars in the field have underscored the necessity of implementing intervention measures in universities to promote and preserve the mental health of this population (Ritvo *et al.*, 2021).

The principal limitations of this study are the inability to ascertain a causal relationship between the sociodemographic variables selected and QoL, and the fact that the study employed a non-probabilistic sample, which precludes the generalization of the results. The researchers' inability to access the students' email addresses impeded the dissemination of the survey on a large scale. Furthermore, among those who received an email invitation, the response rate to the questionnaires was low, indicating a lack of engagement among students at both institutions. There are several disadvantages to conducting surveys via email. Firstly, the response rate to online questionnaires is typically lower than for other survey methods. Secondly, the return rate for questionnaires sent by email is 34.8% (Tai *et al.*, 2018).

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Adriana Assis Carvalho. Keila Correia de Alcântara e Flávio Marques Lopes – Conceberam o desenho do estudo.

Adriana Assis Carvalho e Ana Amélia Freitas Vilela – Realizaram a construção do banco de dados, análise dos dados e interpretaram as análises estatísticas.

Adriana Assis Carvalho – Realizou a escrita do artigo sob orientação de Keila Correia de Alcântara e Flávio Marques Lopes

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