Research Article

Quality of Life and Sleep Among Brazilian Speech-Language Pathology Students During the COVID-19 Pandemic

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Purpose: The aim of this study was to identify the factors that are related to the quality of life and sleep of Brazilian speech-language pathology students during the COVID-19 pandemic.
Method: This study adopted a cross-sectional, descriptive observational design. A total of 161 undergraduate speech-language pathology students participated in this study. The relationship between quality of life and sleep, socioeconomic characteristics, and health problems was examined using correlational analysis. Participant data were collected using an online form, which included questions that assessed their socioeconomic and health characteristics during the pandemic; the Pittsburgh Sleep Quality Index; and the first two questions of the World Health Organization Quality of Life–Brief Version.

Results: There were relationships between sleep dysfunction, a reduction in household income during the pandemic, membership to a risk group, living with at-risk individuals, time spent on the Internet (hours), and the purpose underlying Internet use. Satisfaction with health was related to membership to a risk group. Perceptions of the negative impact of the pandemic on mental health were related to sleep dysfunction and quality of life during the pandemic.
Conclusion: The present findings underscore the need for policies that promote health, prevent diseases, and address mental health problems during times of crisis, such as the COVID-19 pandemic.

Higher education is the foundation of economic development (Meseguer-Sánchez et al., 2020). It promotes social improvement (Meseguer-Sánchez et al., 2020), knowledge assimilation (Coulon, 2017), welfare, public health, environmental protection (Meseguer-Sánchez et al., 2020), and critical thinking skills (Carbogim et al., 2019). Therefore, higher education institutions are essential for national development. Challenges facing higher education in Brazil include limited financial resources, severe asymmetries among admitted students, poor retention, and a lack of appreciation for teaching activities

(Gilioli, 2016). Furthermore, there are many barriers to poor student retention and a lack of appreciation as rules are more sophisticated and complex in higher education institutions than in high schools (Coulon, 2017).

The ongoing pandemic caused by COVID-19 poses additional challenges to higher education (Vellingiri et al., 2020). Public health measures, such as social distancing and government shutdowns, to curb the spread of coronavirus (COVID-19) have led to adverse effects on psychological, social, and economic functioning. Educational services were suspended in several countries (Ali & Alharbi, 2020); in Brazil, the suspension was between March and June 2021. To continue the teaching and learning process, technological tools and virtual environments were used in higher education. However, in Brazil, there are limitations to their accessibility (Xavier et al., 2020). Such contexts need to be encouraged as university students are considered to be at risk for common mental disorders owing to the vulnerability to which they are exposed (Gomes et al., 2020).

Epidemics elicit adverse reactions from individuals as they are primarily rooted in the fear of falling ill and dying. The ongoing pandemic, which necessitates prolonged periods

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of social isolation, has negatively affected the population, especially the most vulnerable groups (Asmundson & Taylor, 2020; Li et al., 2014). The effects of social isolation include (a) a sense of helplessness, boredom, loneliness, and depression; (b) fear of losing one's source of subsistence because of dismissal or fear of being unable to work (among self-employed individuals); (c) avoidance of health care facilities due to fear of contamination; (d) a sense of vulnerability due to the inability to protect one's loved ones; and (e) a scarcity or an excess of tasks and activities at home (International Federation of Red Cross and Red Crescent Societies, 2020). The COVID-19 pandemic has led to an increase in the prevalence of posttraumatic stress disorder (Liu et al., 2020; Sun et al., 2021), anxiety (Cao et al., 2020), depression (Zhou et al., 2020), feelings of loneliness (Kılınçel et al., 2020), and poor quality of life and sleep (Kaparounaki et al., 2020).

Health care students work closely with the disease, witness patients' deaths, and have a high workload. These factors make them susceptible to common mental health issues (Gomes et al., 2020), drop in academic performance (Saraiva et al., 2019), worsening quality of life (de Barros et al., 2017), sleep disorders, and use of psychoactive drugs, such as alcohol and cigarettes (Carone et al., 2020). A decrease in their quality of life can lead to stress and an increase in cortisol levels (Chaves et al., 2016), which interferes with sleep quality (de Araújo et al., 2016).

Studies have shown that COVID-19 has negatively affected university students' health. Psychological effects such as anxiety, depression, and stress have been reported in Spanish (Odriozola-González et al., 2020), French (Wathelet et al., 2020), Colombian (Pedrozo-Pupo et al., 2020), and Brazilian (Araújo et al., 2020) students. Furthermore, American university students reported fear and worry about their and their loved ones' health, difficulty in concentrating, disruptions in sleeping patterns, decreased social interactions due to physical distancing, and increased concerns about academic performance (Son et al., 2020). Chinese university students also showed feelings of extreme fear, followed by short periods of sleep, especially those who were in their final year and lived in severely affected areas (Tang et al., 2020). First-year Japanese university students experienced high academic distress as they had to adapt to an unfamiliar e-learning environment (Horita et al., 2021).

Thus, preliminary findings suggest that students are a vulnerable population (Cao et al., 2020; Kaparounaki et al., 2020; Patsali et al., 2020). However, no study has been conducted with speech-language pathology students. Thus, there is a need to study this population in order to verify possible peculiarities in their self-perception of quality of life and sleep during the COVID-19 pandemic. Therefore, this study aimed to identify the factors that are related to the quality of life and sleep of Brazilian speech-language pathology students during the COVID-19 pandemic.

Method

This study adopted a cross-sectional, descriptive observational design. It was approved by the Brazilian National Research Council (CAAE No. 30580420.4.0000.5546) and was conducted following the guidelines drafted by the National Health Council.

Participants

Undergraduate students in speech-language pathology of both genders, aged over 18 years, who were of Brazilian origin, who lived in Brazil during the COVID-19 pandemic, and who signed the free informed consent form were included in the study. Participants who did not answer any item in the data collection instruments were excluded from the study. Thus, the participants were 161 speech-language pathology students between the ages of 18 and 40 years, with a mean age of 24.2 ($SD = 6.40$). They were primarily female (86.96%) and attended public university (86.96%).

Nonprobabilistic sampling was used. An invitation e-mail was sent to speech therapy program coordinators of the speech-language pathology courses in Brazil. It was requested that the invitation be forwarded to students who met the research eligibility criteria. The data were collected in June 2020 using Google Forms.

The sample size was calculated using the correlation hypothesis test. Data on the correlation coefficient between the self-assessment of quality of life during the pandemic and the global score of the Pittsburgh Sleep Quality Index (PSQI) were used. The parameters used to estimate the required sample size were population correlation (rho) of .3260, Type I error rate (alpha) of .0500, and power of .9000. The minimum required sample size was 94.

Procedure

A survey was developed by the authors to collect the participants' socioeconomic characteristics and data related to COVID-19, perceived quality of life, and perceived quality of sleep (see the Appendix). The outcome variables were evaluated using the PSQI (Bertolazi et al., 2011) and two items from the World Health Organization Quality of Life–Brief Version (WHOQOL-BREF; Fleck et al., 2000; The WHOQOL Group, 1998).

The measurement of self-perceived quality of life and health satisfaction used two questions from the WHOQOL-BREF, translated and validated in Brazilian Portuguese. Each item was rated on a 5-point Likert scale (1 = *worst quality of life*, 5 = *best quality of life*; Fleck et al., 2000; The WHOQOL Group, 1998). Higher scores indicate better quality of life.

Sleep quality was assessed using the Brazilian Portuguese version of the PSQI, which was previously validated. This assessment consists of 19 self-report items divided into seven domains (subjective quality of sleep, sleep latency, sleep duration, habitual sleep efficiency, sleep disorders, use of sleep medications, and daytime dysfunction), and scores can be computed for each domain. Scores can range from 0 (*no difficulty*) to 3 (*severe difficulty*), and higher scores indicate worse sleep quality. The analysis followed the guidelines of the authors (Bertolazi et al., 2011).

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Data Analysis

The collected data were subjected to descriptive and inferential statistical analyses, which were conducted using SPSS Version 25.0. Qualitative nominal variables were examined by computing relative and absolute frequencies. Measures of variability (standard deviation), central tendency (mean and median), and position (first and third quartiles) were calculated to examine quantitative continuous and qualitative ordinal variables. Regarding inferential statistical analyses, the Shapiro–Wilk test was used to evaluate the normality of the distribution of the quantitative variables.

Differences in qualitative ordinal (self-perceived sleep) and nonnormal quantitative (self-perceived quality of life) variables between two independent groups (reduced household income due to the pandemic, belongs to the risk group, lives with a member of the risk group for COVID-19) were examined using the Mann–Whitney U test. Multiple independent groups (total daily time on the Internet, the primary purpose of using the Internet, and harmful interference of the pandemic on mental health) were compared using the Kruskal–Wallis test. The multiple comparisons were undertaken using Tukey's test. Significance values were adjusted using the Bonferroni correction within SPSS, which employs a mathematically equivalent adjustment to display corrected p values on the α of .05 scale. The correlations between nonnormal quantitative (self-perceived quality of life) and qualitative ordinal (self-perceived sleep) variables were calculated using the Spearman rank-order correlation coefficient. The significance level for all comparisons was set at an α of .05.

Results

As shown in Table 1, higher frequencies emerged for the following variables: reduced household income during the pandemic, not at risk for COVID-19, living with individuals who are at risk for COVID-19, spending 8–12 hr per day on the Internet during the pandemic, the primary purpose of using the Internet during the pandemic was to access social networks, and perceptions of the negative impact of the pandemic on mental health. The participants obtained a median score of 3.0 on the WHOQOL-BREF, which was used to assess the quality of life during the pandemic. This indicates that they perceived their quality of life as neither good nor bad. Furthermore, they were neither satisfied nor dissatisfied with their health. The following medians emerged for the PSQI: habitual sleep efficiency and use of sleeping medications = 0.00; sleep duration = 1.00; subjective sleep quality, sleep latency, sleep disorders, and daytime dysfunction = 2.00; and global score = 9.0 (poor sleep quality).

Table 2 shows that there was a negative correlation between satisfaction with health and all sleep quality factors. Negative correlations were also identified between perceived quality of life during the pandemic and subjective quality of sleep, sleep latency, sleep disorders, use of sleep medications, and daytime dysfunction ($ps < .05$). The participants who reported a reduction in household income reported

significantly higher daytime dysfunction scores ($p = .048$) than those who reported no reduction in household income (see Table 3).

Table 4 shows that students who were at risk for COVID-19 showed lower health satisfaction scores and higher subjective sleep quality, duration of sleep, and global PSQI scores ($ps < .05$). The students who were living with individuals who were at risk for COVID-19 reported significantly higher sleep duration scores ($p = .044$) than students who were not living with at-risk individuals (see Table 5).

Table 6 shows that there was a difference in perceived quality of life during the pandemic (WHOQOL-BREF), satisfaction with health (WHOQOL-BREF), and daytime dysfunction (PSQI; $ps < .05$) between subgroups regarding total daily time on the Internet during the pandemic. The multiple comparison test revealed that those who used the Internet for 8–12 hr per day reported significantly higher quality-of-life scores than those who used the Internet for less than 8 hr or more than 12 hr ($ps < .05$). Students who used the Internet for 8–12 hr showed higher satisfaction with health than those who used the Internet for less than 8 hr and more than 12 hr ($ps < .05$). Regarding daytime dysfunction, those who used the Internet for more than 12 hr per day reported significantly higher

Table 1. Descriptive analysis of data related to the COVID-19 pandemic in speech-language pathology students.

Variable and categories	n	%
Reduced household income with the pandemic		
No	56	34.78
Yes	105	65.22
Individual in the risk group for COVID-19		
No	126	78.26
Yes	35	21.74
Resides with an individual in the risk group for COVID-19		
No	48	29.81
Yes	113	70.19
Total daily time on the Internet during the pandemic (hr)		
< 8	50	31.06
8–12	65	40.37
> 12	46	28.57
The primary purpose of using the Internet during the pandemic		
To study	17	10.56
To work	16	9.94
Use social networks	76	47.20
Watching movies/documentaries/series	44	27.33
Play	2	1.24
Read pandemic-related news	6	3.73
Harmful interference of the pandemic on mental health		
No	14	8.70
Partially	62	38.51
Yes	85	52.80

Note. n = absolute frequency; % = percentage relative frequency.

Table 2. Correlation between quality of life and quality of sleep in speech-language pathology students.

| | WHOQOL-BREF | | | |
| | Self-assessment of quality of life during the pandemic | | Satisfaction with health during the pandemic | |
PSQI	r	p	r	p
Subjective quality of sleep	−.378	< .001*	−.549	< .001*
Sleep latency	−.210	.008*	−.298	< .001*
Sleep duration	−.087	.271	−.24	.002*
Habitual sleep efficiency	−.094	.237	−.222	.005*
Sleep disorders	−.166	.035*	−.344	< .001*
Use of sleep medications	−.164	.037*	−.227	.004*
Daytime dysfunction	−.317	< .001*	−.415	< .001*
Global score	−.326	< .001*	−.522	< .001*

Note. WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

scores than those who used the Internet for less than 8 hr (*p* = .020).

There were differences in two PSQI factor scores, namely, subjective sleep quality and daytime dysfunction (*p*s < .05), of the subgroups of the primary purpose of Internet use during the pandemic. The multiple comparison test revealed that those who used the Internet to study reported significantly lower daytime dysfunction and subjective quality of sleep (*p*s < .05) scores than those who used the Internet to access social networking sites (see Table 7).

Table 8 shows the relationship of self-perception about the interference of the pandemic with mental health and the self-perception of quality of life, health, and domains related to sleep. Participants who reported perceptions about the negative impact of the pandemic on mental health reported lower quality-of-life scores (WHOQOL-BREF) than those who reported partial or no interference (*p*s < .05). Similar

Table 3. Comparison of self-perceived quality of life and sleep between the subgroups of the reduced household income with the pandemic variable in speech-language pathology students.

Variable	Reduced household income with the pandemic	M	SD	1Q	Mdn	3Q	p
WHOQOL-BREF							
Self-assessment of quality of life during the pandemic	No	3.02	0.90	2.00	3.00	4.00	.120
	Yes	2.77	0.94	2.00	3.00	3.00	
Satisfaction with health during the pandemic	No	2.89	0.97	2.00	3.00	4.00	.293
	Yes	2.71	1.07	2.00	3.00	4.00	
PSQI							
Subjective quality of sleep	No	1.70	0.71	1.00	2.00	2.00	.257
	Yes	1.80	0.80	1.00	2.00	2.00	
Sleep latency	No	2.13	0.95	1.00	2.00	3.00	.119
	Yes	1.88	0.99	1.00	2.00	3.00	
Sleep duration	No	0.75	0.86	0.00	1.00	1.00	.896
	Yes	0.75	0.91	0.00	1.00	1.00	
Habitual sleep efficiency	No	0.66	1.00	0.00	0.00	1.00	.295
	Yes	0.55	0.98	0.00	0.00	1.00	
Sleep disorders	No	1.71	0.68	1.00	2.00	2.00	.246
	Yes	1.83	0.70	1.00	2.00	2.00	
Use of sleep medications	No	0.55	1.06	0.00	0.00	0.75	.370
	Yes	0.65	1.06	0.00	0.00	1.00	
Daytime dysfunction	No	1.48	0.76	1.00	1.00	2.00	.048*
	Yes	1.73	0.79	1.00	2.00	2.00	
Global score	No	8.98	3.76	6.00	8.50	11.7	.638
	Yes	9.19	3.96	6.00	9.00	12.0	

Note. 1Q = first quartile; 3Q = third quartile; WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

Table 4. Comparison of self-perceived quality of life and sleep between the subgroups of the individual in the risk group for COVID-19 variable in speech-language pathology students.

Variable	Individual in the risk group for COVID-19	M	SD	1Q	Mdn	3Q	p
WHOQOL-BREF							
Self-assessment of quality of life during the pandemic	No	2.90	0.94	2.00	3.00	4.00	.230
	Yes	2.69	0.90	2.00	3.00	3.00	
Satisfaction with health during the pandemic	No	2.88	0.99	2.00	3.00	4.00	.015*
	Yes	2.40	1.12	2.00	2.00	3.00	
PSQI							
Subjective quality of sleep	No	1.70	0.74	1.00	2.00	2.00	.027*
	Yes	2.00	0.84	2.00	2.00	3.00	
Sleep latency	No	1.98	0.95	1.00	2.00	3.00	.895
	Yes	1.91	1.09	1.00	2.00	3.00	
Sleep duration	No	0.67	0.83	0.00	0.00	1.00	.034*
	Yes	1.06	1.03	0.00	1.00	2.00	
Habitual sleep efficiency	No	0.56	0.93	0.00	0.00	1.00	.819
	Yes	0.71	1.15	0.00	0.00	2.00	
Sleep disorders	No	1.73	0.66	1.00	2.00	2.00	.064
	Yes	2.00	0.77	1.00	2.00	3.00	
Use of sleep medications	No	0.53	0.98	0.00	0.00	1.00	.102
	Yes	0.91	1.27	0.00	0.00	2.00	
Daytime dysfunction	No	1.57	0.73	1.00	2.00	2.00	.052
	Yes	1.91	0.92	1.00	2.00	3.00	
Global score	No	8.73	3.70	6.00	8.00	11.00	.031*
	Yes	10.51	4.24	7.00	10.00	15.00	

Note. 1Q = first quartile; 3Q = third quartile; WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

Table 5. Comparison of self-perceived quality of life and sleep between the subgroups of the residing with an individual in the risk group for COVID-19 variable in speech-language pathology students.

Variable	Do you reside with an individual of the risk group for SARS-CoV-2	M	SD	1Q	Mdn	3Q	p
WHOQOL-BREF							
Self-assessment of quality of life during the pandemic	No	2.92	1.01	2.00	3.00	4.00	.533
	Yes	2.83	0.91	2.00	3.00	3.00	
Satisfaction with health during the pandemic	No	2.75	1.18	2.00	3.00	4.00	.854
	Yes	2.79	0.98	2.00	3.00	4.00	
PSQI							
Subjective quality of sleep	No	1.75	0.73	1.00	2.00	2.00	.822
	Yes	1.77	0.79	1.00	2.00	2.00	
Sleep latency	No	1.81	1.07	1.00	2.00	3.00	.259
	Yes	2.03	0.94	1.00	2.00	3.00	
Sleep duration	No	0.52	0.71	0.00	0.00	1.00	.044*
	Yes	0.85	0.94	0.00	1.00	1.00	
Habitual sleep efficiency	No	0.44	0.87	0.00	0.00	0.75	.166
	Yes	0.65	1.02	0.00	0.00	1.00	
Sleep disorders	No	1.75	0.73	1.00	2.00	2.00	.647
	Yes	1.81	0.68	1.00	2.00	2.00	
Use of sleep medications	No	0.56	1.05	0.00	0.00	1.00	.590
	Yes	0.64	1.06	0.00	0.00	1.00	
Daytime dysfunction	No	1.52	0.92	1.00	1.00	2.00	.205
	Yes	1.70	0.72	1.00	2.00	2.00	
Global score	No	8.35	3.81	6.00	8.00	11.00	.125
	Yes	9.44	3.88	6.00	9.00	12.00	

Note. 1Q = first quartile; 3Q = third quartile; WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

Table 6. Comparison of self-perceived quality of life and sleep between the subgroups of the total daily time on the Internet during the pandemic variable in speech-language pathology students.

Variable	Total daily time on the Internet during the pandemic (hr)	*M*	*SD*	1Q	*Mdn*	3Q	*p*
WHOQOL-BREF							
Self-assessment of quality of life during the pandemic	< 8	2.94	0.77	2.00	3.00	3.25	.003*
	8–12	3.06	0.92	3.00	3.00	4.00	
	> 12	2.48	1.03	2.00	2.00	3.00	
Satisfaction with health during the pandemic	< 8	2.92	0.99	2.00	3.00	4.00	.005*
	8–12	2.97	0.93	2.00	3.00	4.00	
	> 12	2.35	1.12	1.00	2.00	3.00	
PSQI							
Subjective quality of sleep	< 8	1.70	0.74	1.00	2.00	2.00	.493
	8–12	1.72	0.76	1.00	2.00	2.00	
	> 12	1.89	0.82	1.00	2.00	3.00	
Sleep latency	< 8	2.02	0.96	1.00	2.00	3.00	.546
	8–12	1.86	1.00	1.00	2.00	3.00	
	> 12	2.04	0.99	1.00	2.00	3.00	
Sleep duration	< 8	0.80	0.90	0.00	1.00	1.00	.609
	8–12	0.66	0.83	0.00	0.00	1.00	
	> 12	0.83	0.95	0.00	1.00	1.00	
Habitual sleep efficiency	< 8	0.58	1.05	0.00	0.00	1.00	.457
	8–12	0.65	0.94	0.00	0.00	1.00	
	> 12	0.52	0.98	0.00	0.00	1.00	
Sleep disorders	< 8	1.80	0.76	1.00	2.00	2.00	.995
	8–12	1.77	0.61	1.00	2.00	2.00	
	> 12	1.80	0.75	1.00	0.00	0.00	
Use of sleep medications	< 8	0.46	0.99	0.00	0.00	0.00	.188
	8–12	0.65	1.07	0.00	0.00	1.00	
	> 12	0.74	1.10	0.00	0.00	1.00	
Daytime dysfunction	< 8	1.48	0.74	1.00	1.50	2.00	.018*
	8–12	1.58	0.77	1.00	2.00	2.00	
	> 12	1.91	0.81	1.00	2.00	2.25	
Global score	< 8	8.84	4.09	6.00	8.00	12.00	.571
	8–12	8.89	3.76	6.00	9.00	11.00	
	> 12	9.74	3.84	6.00	9.00	12.00	

Note. 1Q = first quartile; 3Q = third quartile; WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

results emerged for satisfaction with health (WHOQOL-BREF; *p*s < .05).

Regarding the PSQI, those who reported perceptions about the negative impact of the pandemic on mental health reported higher scores on the following dimensions than those who reported partial or no interference: subjective quality of sleep, sleep latency, daytime dysfunction, and global scores (*p*s < .05). The multiple comparison test revealed that significantly higher sleep efficiency scores were reported by those who perceived interference than by those who did not perceive any harmful interference (*p* < .001).

Discussion

The primary objective of the study was to identify the factors that are related to the qualities of life and sleep of Brazilian speech-language pathology students during COVID-19. There was a higher frequency of participants who reported poor sleep quality. Furthermore, the quality of life of

the students during the pandemic was reported as "neither good nor bad," and the students reported being "neither satisfied nor dissatisfied" with their health. It is important to note that all of the participants' data in this study were self-reported and may not be accurate reflections of their true status. However, these results appear to support those of a study carried out with university students during the COVID-19 quarantine in Greece, showing a reduction in the quality of life at 57% and in the quality of sleep at 43% (Kaparounaki et al., 2020).

These results may be explained by changes in academic activities (e.g., suspension of activities or transition to remote learning) and social isolation requirements, which may have resulted in poor sleep quality by disrupting daily routine and reducing the time spent on physical activity and leisure activities. In studies conducted on children and adolescents (Wang et al., 2020) and university students (Gallo et al., 2020), the suspension of school activities during the pandemic was associated with decreased physical activity, greater screen

Table 7. Comparison of self-perceived quality of life and sleep between the subgroups of the primary purpose of using the Internet during the pandemic variable in speech-language pathology students.

Variable	The primary purpose of using the Internet	*M*	*SD*	1Q	*Mdn*	3Q	*p*
WHOQOL-BREF							
Self-assessment of quality of life during the pandemic	To study	3.24	1.03	3.00	3.00	4.00	.219
	To work	2.81	0.91	2.00	3.00	3.75	
	Use social networks	2.80	0.95	2.00	3.00	3.75	
	Watching movies/documentaries/series	2.91	0.88	2.00	3.00	4.00	
	Play	3.00	1.41	2.00	3.00	0.00	
	Read pandemic-related news	2.17	0.41	2.00	2.00	2.25	
Satisfaction with health during the pandemic	To study	3.29	1.10	2.00	4.00	4.00	.295
	To work	2.63	0.89	2.00	2.50	3.00	
	Use social networks	2.79	1.05	2.00	3.00	4.00	
	Watching movies/documentaries/series	2.70	1.00	2.00	3.00	3.75	
	Play	2.50	2.12	1.00	2.50	0.00	
	Read pandemic-related news	2.17	0.75	1.75	2.00	3.00	
PSQI							
Subjective quality of sleep	To study	1.53	0.87	1.00	1.00	2.00	.025*
	To work	1.94	0.85	1.25	2.00	2.75	
	Use social networks	1.63	0.71	1.00	2.00	2.00	
	Watching movies/documentaries/series	1.91	0.77	1.25	2.00	2.00	
	Play	2.50	0.71	2.00	2.50	0.00	
	Read pandemic-related news	2.33	0.52	2.00	2.00	3.00	
Sleep latency	To study	1.71	0.99	1.00	2.00	2.50	.805
	To work	1.94	1.18	1.00	2.00	3.00	
	Use social networks	2.03	0.88	1.00	2.00	3.00	
	Watching movies/documentaries/series	1.93	1.07	1.00	2.00	3.00	
	Play	1.50	2.12	0.00	1.50	0.00	
	Read pandemic-related news	2.33	0.82	1.75	2.50	3.00	
Sleep duration	To study	0.65	0.61	0.00	1.00	1.00	.157
	To work	1.13	1.02	0.00	1.00	2.00	
	Use social networks	0.61	0.80	0.00	0.00	1.00	
	Watching movies/documentaries/series	0.82	1.02	0.00	0.50	1.00	
	Play	1.00	0.00	1.00	1.00	1.00	
	Read pandemic-related news	1.33	1.03	0.75	1.00	2.25	
Habitual sleep efficiency	To study	0.18	0.39	0.00	0.00	0.00	.403
	To work	0.69	0.95	0.00	0.00	1.00	
	Use social networks	0.58	1.00	0.00	0.00	1.00	
	Watching movies/documentaries/series	0.73	1.13	0.00	0.00	1.00	
	Play	0.00	0.00	0.00	0.00	0.00	
	Read pandemic-related news	0.83	0.98	0.00	0.50	2.00	
Sleep disorders	To study	1.65	0.79	1.00	1.00	2.00	.178
	To work	2.19	0.75	2.00	2.00	3.00	
	Use social networks	1.71	0.61	4.00	0.00	0.00	
	Watching movies/documentaries/series	1.80	0.73	1.00	2.00	2.00	
	Play	2.00	1.41	1.00	2.00	0.00	
	Read pandemic-related news	2.00	0.63	1.75	2.00	2.25	
Use of sleep medications	To study	0.53	0.87	0.00	0.00	1.00	.468
	To work	0.88	1.36	0.00	0.00	2.75	
	Use social networks	0.71	1.11	0.00	0.00	1.00	
	Watching movies/documentaries/series	0.41	0.90	0.00	0.00	0.00	
	Play	1.50	2.12	0.00	1.50	0.00	
	Read pandemic-related news	0.17	0.41	0.00	0.00	0.25	
Daytime dysfunction	To study	1.06	0.83	0.50	1.00	1.50	.017*
	To work	1.63	1.02	1.00	1.50	2.75	
	Use social networks	1.75	0.75	1.00	2.00	2.00	
	Watching movies/documentaries/series	1.61	0.65	1.00	2.00	2.00	
	Play	2.50	0.71	2.00	2.50	0.00	
	Read pandemic-related news	2.00	0.63	1.75	2.00	2.25	

(table continues)

Table 7. *(Continued).*

Variable	The primary purpose of using the Internet	M	SD	1Q	Mdn	3Q	p
Global score	To study	7.29	3.27	5.00	6.00	9.00	.145
	To work	10.38	5.16	6.00	10.50	14.50	
	Use social networks	9.01	3.68	6.00	8.50	11.75	
	Watching movies/documentaries/series	9.20	3.89	6.25	9.00	11.75	
	Play	11.00	5.66	7.00	11.00	0.00	
	Read pandemic-related news	11.00	2.45	8.75	11.00	12.75	

Note. 1Q = first quartile; 3Q = third quartile; WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

time, irregular sleep patterns, and less healthy diet. The absence of a daily routine directly affects sleep regularity (Barros et al., 2019). Furthermore, physical inactivity and an abrupt decrease in leisure activities, which have been observed among young adults (Barros et al., 2019; Kredlow et al., 2015; Ropke et al., 2018), are associated with poor sleep quality.

In this study, sleep quality was directly related to the perceived quality of life and satisfaction with health. Thus,

as the sleep quality of university students worsened, their perceived quality of life and health status during the pandemic period reduced. Consistent with the findings of past studies (Barros et al., 2019; Esteves et al., 2015), those who reported poor sleep quality also reported poor quality of life. Furthermore, health and sleep share a strong bidirectional relationship (de Araújo et al., 2014; Li et al., 2014). Their mutual effects can be positive or negative, depending on contextual factors.

Table 8. Comparison of self-perceived quality of life and sleep between the subgroups of the harmful interference of the pandemic on mental health variable in speech-language pathology students.

Variable	Harmful interference of the pandemic on mental health	M	SD	1Q	Mdn	3Q	p
WHOQOL-BREF Self-assessment of quality of life during the pandemic	No	3.43	0.94	3.00	4.00	4.00	< .001*
	Partially	3.19	0.79	3.00	3.00	4.00	
	Yes	2.52	0.91	2.00	3.00	3.00	
WHOQOL-BREF Satisfaction with health during the pandemic	No	3.50	1.16	2.75	4.00	4.00	< .001*
	Partially	3.11	0.96	2.00	3.00	4.00	
	Yes	2.41	0.93	2.00	2.00	3.00	
PSQI Subjective quality of sleep	No	1.21	0.97	0.75	1.00	2.00	< .001*
	Partially	1.56	0.69	1.00	2.00	2.00	
	Yes	2.00	0.71	2.00	2.00	2.00	
PSQI Sleep latency	No	1.57	1.16	1.00	1.00	3.00	.004*
	Partially	1.73	0.96	1.00	2.00	3.00	
	Yes	2.20	0.91	2.00	2.00	3.00	
PSQI Sleep duration	No	0.86	0.95	0.00	1.00	1.25	.463
	Partially	0.63	0.79	0.00	0.00	1.00	
	Yes	0.82	0.94	0.00	1.00	1.00	
PSQI Habitual sleep efficiency	No	0.43	0.94	0.00	0.00	0.25	< .001*
	Partially	0.23	0.56	0.00	0.00	0.00	
	Yes	0.88	1.14	0.00	0.00	2.00	
PSQI Sleep disorders	No	1.64	0.93	1.00	1.50	2.25	.638
	Partially	1.77	0.66	1.00	2.00	2.00	
	Yes	1.82	0.68	4.00	0.00	0.00	
PSQI Use of sleep medications	No	0.14	0.36	0.00	0.00	0.00	.169
	Partially	0.50	0.92	0.00	0.00	1.00	
	Yes	0.78	1.19	0.00	0.00	2.00	
PSQI Daytime dysfunction	No	1.00	0.96	0.00	1.00	2.00	.006*
	Partially	1.60	0.71	1.00	2.00	2.00	
	Yes	1.79	0.76	1.00	2.00	2.00	
PSQI global score	No	6.86	4.83	3.75	6.00	9.75	< .001*
	Partially	8.02	3.20	6.00	7.00	9.25	
	Yes	10.29	3.81	7.00	10.00	12.50	

Note. 1Q = first quartile; 3Q = third quartile; WHOQOL-BREF = World Health Organization Quality of Life–Brief Version; PSQI = Pittsburgh Sleep Quality Index.

*Spearman rank-order correlation coefficient, indicates statistically significant values (*p* value < .05).

Regarding the global PSQI scores, there was a significant relationship between poor sleep quality, membership to groups at risk for COVID-19, and perceptions about the negative impact of the pandemic on mental health. A study examined the prevalence of mental health symptoms and associated risk factors within the general population in China during the COVID-19 pandemic and found that the prevalence of insomnia symptoms was 29.2% and the prevalence of acute stress was 24.4%. Furthermore, the risk for mental health symptoms was higher among infected individuals, those suspected of having been infected, and those who were in contact with infected friends and family members. Moreover, working in person was associated with a lower risk for depression, anxiety, and insomnia (Shi et al., 2020).

In this study, membership to the risk group was directly related to greater dissatisfaction with health, worse sleep quality (poor self-reported sleep quality), and shorter sleep durations. A reduction in household income significantly contributed to greater dysfunction, drowsiness, and a lower level of motivation and enthusiasm to engage in routine activities. Furthermore, living with at-risk individuals interfered with sleep duration. These results are consistent with those of a study conducted among Chinese medical students. Specifically, the following risk factors for increased anxiety were identified: infected family members or acquaintances, economic effects on daily life, and a delay in academic milestones (Cao et al., 2020).

Regarding the daily workload reported by university students with Internet access, it is important to perceive the COVID-19 pandemic within a new social and technological context. Specifically, individuals have access to the Internet and social media, and information can be easily and immediately acquired (Guessoum et al., 2020). Students who used the Internet for 8–12 hr per day reported better quality of life and satisfaction with health than those who used it for less than 8 hr or more than 12 hr. These results suggest that moderate levels of Internet use may have a positive impact on the quality of life and health of university students. Similarly, Kılınçel et al. (2020) found that the closure of schools and universities and home quarantine during the pandemic had resulted in feelings of anxiety and loneliness among young adults. Internet access enables socialization, communication, and maintenance of social interactions during social isolation; provides learning opportunities; grants adolescents access to information about their health; and, consequently, reduces feelings of loneliness and anxiety (Guessoum et al., 2020).

In this study, longer durations of Internet use were associated with greater drowsiness and a lack of motivation during the day. Those who used the Internet for more than 12 hr reported significantly lower daytime dysfunction scores than those who used the Internet for less than 8 hr per day. Students who used the Internet to access social media (primary purpose) also reported significantly worse effects on daytime dysfunction and subjective quality of sleep than those who used the Internet for academic purposes. These results are consistent with the findings of a past study in which social media use was associated with sleep problems (Barry et al., 2017). Furthermore, a recent systematic review of the literature found that time spent on social networking sites is correlated with higher levels of depression, anxiety, and psychological distress (Keles et al., 2020).

A study conducted in Greece found that the COVID-19 outbreak had rendered university students highly vulnerable to depression and suicide. Moreover, a strong endorsement of conspiracy theories (Patsali et al., 2020) that circulated on social media platforms was identified as a significant risk factor.

Conclusions

This study explored relationships between sleep dysfunction, a reduction in household income due to the COVID-19 pandemic, membership to risk groups, living with at-risk individuals, time spent on the Internet (hours), and the purpose underlying Internet use. Satisfaction with health was related to membership in the risk group. Perceptions of the negative impact of the pandemic on mental health were related to sleep dysfunction and perceived quality of life during the pandemic. The present findings regarding the quality of life and sleep of Brazilian speech-language pathology students during the COVID-19 pandemic underscore the need for policies that promote health, prevent diseases, and address mental health problems.

Author Contributions

Kelly da Silva: Conceptualization (Lead), Data curation (Supporting), Formal analysis (Supporting), Investigation (Supporting), Methodology (Lead), Supervision (Lead), Writing – original draft (Lead), Writing – review & editing (Equal). **Raphaela Barroso Guedes-Granzotti:** Conceptualization (Supporting), Methodology (Supporting), Writing – original draft (Equal), Writing – review & editing (Lead). **Vanessa Veis Ribeiro:** Conceptualization (Equal), Data curation (Lead), Formal analysis (Lead), Methodology (Equal), Writing – original draft (Supporting), Writing – review & editing (Supporting). **Rodrigo Dornelas:** Conceptualization (Supporting), Methodology (Supporting), Writing – original draft (Supporting), Writing – review & editing (Equal). **Pablo Jordão Alcântara Cruz:** Conceptualization (Supporting), Methodology (Supporting), Writing – review & editing (Equal). **Carla Patrícia Hernandez Alves Ribeiro César:** Conceptualization (Equal), Project administration (Lead), Supervision (Lead), Writing – review & editing (Equal).

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Appendix

Sociodemographic Questions

What is your date of birth	_____/_____/_____
What is your gender?	( ) Female
	( ) Male
	( ) Other
What is your type of university?	( ) Private
	( ) Public
Has your family income decreased with the pandemic?	( ) Yes
	( ) No
Are you an individual of the risk group for COVID-19?	( ) Yes
	( ) No
Do you reside with an individual of the risk group for COVID-19?	( ) Yes
	( ) No
What is your total daily time on the Internet during the pandemic?	( ) < 8 hr
	( ) 8–12 hr
	( ) > 12 hr
What is your primary purpose for using the Internet during the pandemic?	( ) To study
	( ) To work
	( ) Use social networks
	( ) Watching movies/documentaries/series
	( ) Play
	( ) Read pandemic-related news
Do you think the pandemic interfered with your mental health?	( ) No
	( ) Partially
	( ) Yes