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Impact Of The SARS-CoV-2 Pandemic On The Academic Self-Concept Of University Students In The Western Amazon

Érica Dos Santos Pontes Ricciard, Jhonatan Gomes Gadelha, Débora Melo Aguiar Dantas, Adrya Lohana Da Silva Rodrigues, Natan Lima Ossami, Eder Ferreira De Arruda, Marcelândia De Souza Nogueira, Jader De Andrade Bezerra, Jaqueline Dos Santos Valente Barros, Romeu Paulo Martins Silva
(Universidade Federal Do Acre, Brazil)
(Federal Institute Of Acre, Brazil)
(Uninorte University Center /Acre,Brazil)

Abstract:
Background: *The COVID-19 pandemic has profoundly altered social, academic, and emotional dynamics among university students, influencing their perceptions of self and identity formation. Understanding these changes is essential for promoting mental health and academic well-being in higher education institutions.*
Objective: To describe the changes resulting from the pandemic period and its impact on the self-concept of university students from five academic centers at the Federal University of Acre (UFAC), comparing pre- and post-pandemic periods.
Materials and Methods*: This was a quantitative, descriptive-comparative, longitudinal study involving 219 students. The first data collection occurred in 2019 (before the pandemic), and the second in 2023 (after the pandemic). Participants completed two instruments: a sociodemographic questionnaire and the AF5 scale for multidimensional assessment of self-concept. Data were tabulated in Microsoft Excel and analyzed using the JAMOVI software (version 2.1.26). The Wilcoxon test was applied for inferential comparison, adopting a significance level of $p \leq 0.05$.*
Results*: The overall self-concept remained stable between the two periods (before: $M = 58.2 \pm 10.9$; after: $M = 58.1 \pm 25.1$). However, the social, academic, emotional, and physical domains showed higher scores before the pandemic compared with after (social: $M = 64.7 \pm 18.8$ vs. 60.0 ± 15.2; academic: $M = 59.4 \pm 12.4$ vs. 54.3 ± 22.5; emotional: $M = 52.2 \pm 22.7$). Conversely, the family domain improved after the pandemic ($M = 71.2 \pm 13.3$). Inferential analysis revealed a statistically significant difference only in the academic self-concept domain ($W = 2.67$, $p = 0.03$), while the other domains showed no significant changes.*
Conclusion: *The decline in academic self-concept among students may have resulted from the structural and psychosocial disruptions caused by the pandemic, including infection rates, misinformation, loss of relatives, social isolation, and rapid adaptations in teaching practices. These findings highlight the need for institutional strategies to strengthen students' self-perception, resilience, and academic engagement in the post-pandemic context.*

Key Word: *Self-perception; Pandemic; Students; Higher education.*

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I. Introduction

Self-concept can be described as a theoretical construct developed by the individual through interaction with the social environment, as the perception a person has of themselves influences how they interpret the reactions of others toward them [1]. These core individual characteristics are directly related to personal competence and, consequently, to students' success in educational settings [2].

The assessment of self-concept is essential from elementary school to university levels [3]. As an important protective factor, self-concept represents a key element in mental health promotion and prevention programs [4]. Several variables can influence students' performance, such as emotional profile [5] and family support [6], which may act as positive or negative predictors of self-concept [7].

Moreover, affective-emotional factors influence academic performance from childhood onward, and understanding such limitations requires analyzing their close interrelationship with family dynamics [8].

Regarding family context, the development of strategies aimed at strengthening academic self-concept is crucial, since this construct predicts students' adaptation and persistence during the first year of higher education [3,9].

In this perspective, external factors can positively or negatively influence individuals' self-determination and, consequently, their self-concept. In recent years, one of the most significant global events affecting university students' well-being has been the COVID-19 pandemic [10]. This health crisis disrupted nearly all aspects of human life, generating profound physical, emotional, and social impacts on both individual and population levels [11]. Higher education was no exception, as the pandemic continued to affect academic systems worldwide through 2021 [12]. By October 2023, more than 771,191,203 confirmed cases and 6,961,014 deaths from COVID-19 had been reported globally [13].

Financial difficulties, concerns about family members' health, and anxiety caused by unreliable information on social media were among the main stressors experienced by university students during the pandemic [14]. Additionally, online learning contributed to feelings of social isolation and loss of interpersonal connection among peers [15].

A sense of efficacy, contribution, and understanding of one's own process fosters personal satisfaction and resilience [16]. Importantly, mental health problems can be mitigated through interventions focused on enhancing self-concept and mindfulness among students [17]. Individuals who report satisfaction with their competence, autonomy, and relationships tend to display higher intrinsic motivation and better mental health outcomes; conversely, threats to these dimensions lead to decreased motivation and well-being [18].

Given the multidimensional nature of self-concept and the paucity of studies addressing its variations during the pandemic period, further research is needed to deepen understanding of its determinants and consequences [4,9]. Therefore, this study aims to describe the changes resulting from the pandemic period and their impact on the self-concept of undergraduate students from five academic centers at the Federal University of Acre (UFAC) before and after the COVID-19 pandemic.

II. Material And Methods

Study Design

This was a quantitative, descriptive-comparative, longitudinal study.

Participants

The sample consisted of 219 graduating students from the following academic centers of the Federal University of Acre, a public institution located in the Western Amazon region of Brazil: Center for Health and Sports Sciences (CCSD), Center for Biological and Natural Sciences (CCBN), Center for Education, Letters, and Arts (CELA), Center for Philosophy and Human Sciences (CFCH), and Center for Exact and Technological Sciences (CCET). Participants were aged between 21 and 48 years (M = 24.01; SD = 5.60), mostly female (n = 119; 54.6%) and single (n = 179; 81.7%).

Instruments

Two instruments were used:

1. **Sociodemographic Questionnaire**, designed to collect information on personal and contextual variables such as age, gender, marital status, academic course, housing situation, employment status, leisure and physical activities, health perception, medication use, smoking and alcohol consumption, receipt of scholarships or financial aid, institutional involvement, and pandemic-related experiences (e.g., course interruptions and family losses due to COVID-19).
2. **AF5 Self-Concept Scale**, a self-report instrument composed of 30 items assessing five dimensions: academic, social, emotional, family, and physical. The items are rated on a Likert-type scale ranging from 1 to 99, with higher scores indicating greater self-concept in each domain.

Procedures

As a longitudinal study, the first data collection took place in 2019, when students were beginning their undergraduate programs, prior to the COVID-19 pandemic. The second phase was conducted in 2023, after the pandemic period. Updated enrollment lists were obtained from course offices, excluding students who had failed, dropped out, or changed majors. Eligible participants were individually contacted, informed about the study's objectives, and invited to participate again. Those who consented completed the instruments, which were administered collectively in classrooms or individually, depending on availability. The application time ranged from 30 to 50 minutes.

This study complied with the Brazilian National Health Council Resolutions No. 466/2012 and N°. 510/2016 and was approved by the Research Ethics Committee of the Faculty of Arts of Paraná – UNESPAR (Approval No. 3.325.930; CAAE: 13486519.5.0000.0094; May 14, 2019).

Data Analysis

Data were organized in Microsoft Excel spreadsheets and analyzed using the JAMOVI software (version 2.1.26). Descriptive analyses included absolute and relative frequencies for categorical variables, and means, medians, standard deviations, interquartile ranges, maximum, and minimum values for numerical variables. Normality was tested using the Shapiro–Wilk test, which indicated non-normal distribution for the variables "academic self-concept," "overall quality of life," "sitting time," and "physical activity time." Based on these results, paired *t*-tests were applied for parametric variables and Wilcoxon signed-rank tests for non-parametric variables, adopting a significance level of $p \leq 0.05$ and a 95% confidence interval.

III. Result

In the initial data collection conducted in 2019, a total of 617 students participated, with a mean age of 20.83 years (SD = 4.15), ranging from 18 to 45 years. The majority were male (n = 331; 53.6%), single (n = 552; 89.5%), unemployed (n = 518; 84.1%), and resided on campus (n = 298; 48.3%). Most participants did not receive scholarships (n = 510; 83.2%), engaged in leisure activities (n = 376; 61%), and reported no health problems (n = 487; 78.9%).

Furthermore, they did not use medication (n = 544; 88.3%), did not smoke (n = 593; 96.1%), did not consume alcoholic beverages (n = 452; 73.4%), did not practice physical activity (n = 348; 56.5%), and did not follow a specific diet (n = 545; 88.3%). Regarding socioeconomic status, most students belonged to social class C1 (n = 149; 24.1%) (Table 1).

Table 1: Absolute and relative frequencies of social and health variables among first-year undergraduate students enrolled at the Federal University of Acre, 2019

Variable	Absolute Frequency (N)	Relative Frequency (%)	Cumulative Relative Frequency (%)
Sex			
Male	331	53.6	53.6
Female	287	46.4	100.0
Total	**617**	**100.0**	—
Marital Status			
Single	552	89.5	89.5
Married	59	9.6	99.0
Divorced	5	0.8	99.8
Widowed	1	0.2	100.0
Total	**617**	**100.0**	—
Employment Status			
No	518	84.1	84.1
Yes	99	15.9	100.0
Total	**617**	**100.0**	—
Type of Residence			
Institutional housing (on-campus)	298	48.3	48.3
Financed housing (government-supported)	124	20.1	68.4
Family-owned	4	0.6	69.0
Own property	188	30.5	99.5
Rented	3	0.5	100.0
Total	**617**	**100.0**	—
Scholarship			
No	510	83.2	83.2
Yes	103	16.8	100.0
Total	**613**	**100.0**	—
Leisure Activities			
No	240	39.0	39.0
Yes	376	61.0	100.0
Total	**616**	**100.0**	—
Health Problems			
No	487	78.9	78.9
Yes	130	21.1	100.0
Total	**617**	**100.0**	—
Medication Use			
No	544	88.3	88.3
Yes	72	11.7	99.8
Total	**616**	**100.0**	—
Smoking Habits			
No	593	96.1	96.1

Yes	24	3.9	100.0
Total	**617**	**100.0**	—
Alcohol Consumption			
No	452	73.4	73.4
Yes	164	26.6	100.0
Total	**616**	**100.0**	—
Physical Activity			
No	348	56.5	56.5
Yes	268	43.5	100.0
Total	**616**	**100.0**	—
Dietary Habits			
No specific diet	545	88.3	88.3
Follows a specific diet	72	11.7	100.0
Total	**617**	**100.0**	—
Socioeconomic Class[1]			
A	29	4.7	4.7
B1	64	10.4	15.1
B2	130	21.1	36.1
C1	149	24.1	60.3
C2	144	23.3	83.6
D–E	101	16.4	100.0
Total	**617**	**100.0**	—

[1] According to the *Brazilian Economic Classification Criteria (Critério de Classificação Econômica Brasil)*, the estimated monthly household income for each socioeconomic stratum (in BRL) is as follows: A – 22,749.24; B1 – 10,788.56; B2 – 5,721.72; C1 – 3,194.33; C2 – 1,894.95; D–E – 862.41.

Note: Variations in total frequencies are due to missing responses for certain variables.

Source: Prepared by the authors based on study results.

In the second phase of data collection, conducted after the COVID-19 pandemic, 219 students participated, all of whom were in the final stage of their undergraduate programs. The mean age was 24.01 years (SD = 5.60), ranging from 21 to 48 years.

Most graduating students were female (n = 119; 54.6%), single (n = 179; 81.7%), unemployed (n = 137; 62.2%), and living in their own homes (n = 96; 48.3%).

The majority did not receive a scholarship (n = 141; 64.4%), engaged in leisure activities (n = 118; 54.1%), did not use medication (n = 171; 78.1%), were non-smokers (n = 205; 94.0%), and did not consume alcoholic beverages (n = 145; 66.2%).

Furthermore, half of the participants practiced physical activity (n = 110; 50.5%), did not follow a specific diet (n = 187; 85.8%), and most belonged to social class C2 (n = 60; 27.4%) (Table 2).

Table 2. Absolute and relative frequencies of social and health variables among graduating students in 2023 at the Federal University of Acre

Variable	Absolute Frequency (N)	Relative Frequency (%)	Cumulative Relative Frequency (%)
Sex			
Male	100	45.4	45.4
Female	119	54.6	100.0
Total	219	100.0	—
Marital Status			
Single	179	81.7	81.7
Married	20	9.1	90.8
Divorced	3	1.4	92.2
Other	3	1.4	93.6
Cohabiting	14	6.4	100.0
Total	219	100.0	—
Employment Status			
No	137	62.6	62.6
Yes	82	37.4	100.0
Total	219	100.0	—
Type of Residence			
Institutional housing (on-campus)	1	0.5	0.5
Other	3	1.4	1.9
Family-owned	73	33.3	35.2
Own property	96	43.8	79.0
Rented	46	21.0	100.0
Total	219	100.0	—

Scholarship			
No	141	64.4	64.4
Yes	78	35.6	100.0
Total	219	100.0	—
Leisure Activities			
No	100	45.9	45.9
Yes	118	54.1	100.0
Total	218	100.0	—
Medication Use			
No	171	78.1	78.1
Yes	48	21.9	100.0
Total	218	100.0	—
Smoking Habits			
No	205	94.0	94.0
Yes	13	6.0	100.0
Total	218	100.0	—
Alcohol Consumption			
No	145	66.2	66.2
Yes	74	33.8	100.0
Total	219	100.0	—
Physical Activity			
No	108	49.5	49.5
Yes	110	50.5	100.0
Total	218	100.0	—
Dietary Habits			
No specific diet	187	85.8	85.8
Follows a specific diet	31	14.2	100.0
Total	218	100.0	—
Socioeconomic Class[1]			
A	14	6.4	6.4
B1	26	11.9	18.3
B2	46	21.0	39.3
C1	52	23.7	63.0
C2	60	27.4	90.4
D–E	21	9.6	100.0
Total	219	100.0	—

[1] According to the *Brazilian Economic Classification Criteria (Critério de Classificação Econômica Brasil)*, the estimated monthly household income for each socioeconomic stratum (in BRL) is as follows:
A – 22,749.24; B1 – 10,788.56; B2 – 5,721.72; C1 – 3,194.33; C2 – 1,894.95; D–E – 862.41.
Note: Variations in total frequencies are due to missing responses for certain variables.
Source: Prepared by the authors based on the results of the study.

Given the pandemic context, it became important to investigate several issues related to this perspective. The study examined whether academic activities were affected (e.g., class suspensions), whether any family members were infected with COVID-19, whether deaths occurred in the family due to the infection, and whether the student had personally tested positive for the disease.

Among the participants, 206 students (94.1%) reported that their classes were affected during the pandemic. Regarding family infection, 198 students (90.4%) indicated that relatives had been infected; 164 (74.9%) reported family deaths due to COVID-19, and 116 students (53%) stated that they themselves had tested positive for the virus.

Descriptive analysis of self-concept showed stability between the two measurement periods — first-year students (M = 58.2 ± 10.9) and graduating students (M = 58.1 ± 25.1). The social, academic, emotional, and physical self-concept domains demonstrated higher mean scores at university entry than at graduation (M = 64.7 ± 18.8; M = 60.0 ± 15.2; M = 59.4 ± 12.4; M = 54.3 ± 22.5; M = 52.2 ± 22.7, respectively).

The family domain showed improvement among graduating students, with a mean score of 71.2 ± 13.3. Further details are presented in Table 3.

Table 3. Mean, median, standard deviation, interquartile range, minimum and maximum values of self-concept (and domains)

Variable	Mean	Median	SD[a]	IQR[b]	Min[c]	Max[d]
General Self-Concept (Freshmen)	58.2	58.6	10.9	13.6	7.5	84.5
General Self-Concept (Graduating)	58.1	57.8	25.1	12.7	4.9	92.9
Social SC[e] (Freshmen)	64.7	68.2	18.8	24.8	1.8	98.6
Social SC (Graduating)	67.0	69.6	18.7	21.2	6.2	99.0
Academic SC (Freshmen)	59.4	60.0	12.4	15.2	8.8	92.0

Academic SC (Graduating)	56.5	57.5	13.0	16.4	5.5	82.8
Emotional SC (Freshmen)	54.3	56.3	22.5	33.8	2.7	99.0
Emotional SC (Graduating)	52.2	51.7	22.0	30.6	0.8	97.2
Family SC (Freshmen)	63.4	66.0	15.5	21.2	2.2	99.0
Family SC (Graduating)	71.2	65.0	13.3	21.8	8.0	99.0
Physical SC (Freshmen)	52.2	55.0	22.7	32.7	1.0	99.0
Physical SC (Graduating)	48.7	46.7	22.8	33.7	1.2	99.0

Notes:

[a]SD: Standard Deviation; [b]IQR: Interquartile Range; [c]Min: Minimum; [d]Max: Maximum; [e]SC: Self-Concept.
Descriptive analysis including mean, median, standard deviation, interquartile range, minimum and maximum values of general, social, academic, emotional, family and physical self-concept among freshmen and graduating students.

Source: Prepared by the authors based on the study results.

In the inferential analysis, the Wilcoxon test indicated a statistically significant difference in the academic self-concept domain ($W = 2.67$; $p = 0.036$), whereas the overall score and the social, emotional, family, and physical domains showed no significant differences at the $p \leq 0.05$ level (Table 4).

Table 4. Comparative analysis of self-concept (and domains) among Federal University of Acre students before and after the COVID-19 pandemic

Variable	*Test*	*Mean Difference*	*Standard Error of Difference*	p^b
General Self-Concept	t^a	0.105	1.90	0.956
Social Self-Concept	*t*	-2.343	1.89	0.217
Academic Self-Concept	Wilcoxon	2.67	1.36	0.036*
Emotional Self-Concept	*t*	2.119	2.11	0.317
Family Self-Concept	*t*	-7.828	9.11	0.391
Physical Self-Concept	*t*	3.416	2.13	0.110

Notes:

[a]*t*-test for parametric data; [b]Wilcoxon test for non-parametric data.

Source: Prepared by the authors based on study results.

* $p \leq 0.05$ indicates a statistically significant difference.

The inferential analysis revealed a statistically significant difference only in the academic self-concept between entry and graduation periods, with first-year students presenting a higher median for this variable compared to graduating students.

IV. Discussion

This study analyzed the changes resulting from the pandemic period and their impact on the self-concept of students at the Federal University of Acre, comparing the pre- and post-COVID-19 contexts. Before the pandemic, the sample of first-year students consisted predominantly of males, single, non-working, living on campus, not receiving scholarships, engaging in leisure activities, not practicing regular physical activity, not following any specific diet, and belonging to social class C. After approximately three years of studies and exposure to the pandemic, the graduating students were mostly female, single, with a mean age of 24 years, unemployed, living in their own homes, not receiving scholarships, engaging in leisure and physical activities, not following a diet, and belonging to social class C2.

The sociodemographic profile found in this study is consistent with the 2021 Brazilian Higher Education Census, which reported a predominance of female students aged between 19 and 24 years [19]. Similar findings were observed in international research, showing that women tend to report higher academic self-concept and lower emotional self-concept compared to men [20].

During the pandemic, nearly all participants reported COVID-19 infections among family members, with more than half experiencing deaths related to the disease and many testing positive themselves. The period of social isolation significantly challenged access to mental health care, as mental health and psychosocial support were identified as priorities in South American pandemic responses [21]. Students living with families in urban areas, with sedentary lifestyles and exposure to the virus, were more likely to develop stress. Those who did not engage in physical activity and had confirmed family cases presented a higher risk of depression, reinforcing the protective role of physical activity on mood and emotional well-being [22].

Although leisure and physical activity are not directly linked to academic performance, both contribute to strengthening self-concept and, consequently, improving academic engagement [3]. Promoting university students' health must encompass physical, emotional, mental, and spiritual dimensions, since the fulfillment of basic needs directly affects self-perception and self-concept [22,23]. Self-concept, therefore, functions as a protective factor that enhances well-being and personal satisfaction [4].

The social environment plays a decisive role in individuals' ability to generate happiness and well-being [24]. The pandemic led to the closure of educational institutions and a sudden shift from face-to-face to remote learning, producing one of the most severe educational crises in modern history [25]. In this study, almost all students reported that their classes were affected during this period. Teachers faced significant challenges in restructuring lessons, adapting syllabi, choosing virtual platforms, and maintaining quality standards [26].

Psychological variables related to self-concept are directly associated with academic performance, as a weakened self-concept may hinder effective learning [27]. The results revealed that students exhibited higher social, academic, emotional, and physical self-concept at the beginning of their programs, while family self-concept was higher at graduation. These findings suggest that despite the adversities of the pandemic, many families remained united and resilient, strengthening affective bonds and overcoming collective challenges [28,29].

A statistically significant decline in academic self-concept was observed after the pandemic, indicating that students perceived themselves more positively in academic domains before COVID-19. Previous evidence shows that academic self-concept positively influences deep, surface, and strategic learning approaches, directly impacting academic performance [30]. These findings emphasize the need for higher education educators to foster motivation, autonomy, and learning self-concept, promoting the development of metacognitive skills and self-directed learning [30].

It can be inferred that the main factors contributing to the decline in academic self-concept include family-related aspects (due to infections and losses) [20]; social aspects, such as isolation and misinformation [31–34]; and academic aspects, such as the abrupt transition to online learning, difficulties in internet access, and neglect of mental health care [26,35,36].

Despite limitations related to sample size, resulting from student withdrawal and course changes, these findings remain valid and underscore the need for further studies on academic self-concept and mental health in post-pandemic university contexts.

V. Conclusion

The findings of this study indicate that the pandemic period had a significant impact on the academic self-concept of students at the Federal University of Acre. It was observed that many male students discontinued their studies, that there was a high number of family deaths, and that academic self-concept declined considerably after the pandemic, suggesting direct effects on students' motivation, personal satisfaction, and professional development.

The decrease in academic self-concept among graduating students may be associated with the profound changes experienced during the pandemic, including infection and loss of relatives, social isolation, misinformation, and the abrupt transition from face-to-face to remote learning. Collectively, these factors appear to have influenced students' engagement, performance, and sense of belonging to the university environment.

It should be noted, however, that this study has limitations, particularly because the sample included students from only one higher education institution located in a single city. Considering Brazil's wide cultural, social, and economic diversity, future research should include other institutions, states, and even international contexts to expand the understanding of academic self-concept variations across different educational realities.

Finally, the results highlight the importance of institutional policies aimed at promoting mental health and a positive self-concept within the university environment, especially in times of crisis, to strengthen students' engagement with the learning process and support the formation of more autonomous, critical, and emotionally resilient professionals.

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