

Association between social capital indicators and depressive symptoms among Brazilian university students

Associação entre indicadores de capital social e sintomas depressivos entre estudantes universitários brasileiros

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Abstract *The study aimed to investigate the association between social capital indicators and depressive symptoms among university students from Brazil. The study drew on a sample of 579 randomly selected university students, from a greater crossnational study conducted in 2018. Students completed a self-administered questionnaire assessing depressive symptoms, indicators of social capital and lifestyle behaviors. Data were analyzed using multivariate logistic regression models. Indicators of social capital included trust, group membership and frequency of meeting friends. Four social capital indicators were significantly associated with clinically relevant depressive symptoms. Students who agreed that people are likely to take advantage of one another were more likely to report depressive clinically relevant symptoms (OR: 1.80, 95%CI: 1.00 – 3.23) as well as students who agreed that people are not willing to help in case needed (OR: 2.11, 95%CI: 1.02 – 4.36). Perceived stress, smoking and hazardous alcohol consumption were not associated with clinically relevant depressive symptoms. Social capital plays an important role in explaining depressive symptoms among Brazilian university students. The study suggests that creating trust and enhancing participation in social networks can be an important strategy for promoting mental health among university students investigated in this study.*

Key words *Depressive symptoms, Students, Social capital, Latin America*

Resumo *O estudo investigou a associação entre indicadores de capital social e sintomas depressivos entre estudantes universitários do Brasil. Um estudo transversal foi conduzido com uma amostra de 579 estudantes universitários selecionados randomicamente em 2018. Os estudantes completaram questionários auto-administrados para avaliar sintomas depressivos, indicadores de capital social e comportamentos de estilos de vida. Os dados foram analisados usando modelos de regressão logística multivariada. Indicadores de capital social incluíam confiança, associações em grupos, frequência de encontrar com os amigos, entre outros. Quatro indicadores de capital social se associaram significativamente com relevantes sintomas clínicos de depressão. Estudantes que disseram que as pessoas tendem a tirar mais vantagens umas das outras eram mais propensas a relatar sintomas clínicos relevantes de depressão (OR: 1.80, 95%CI: 1.00 – 3.23), assim como estudantes que relataram que as pessoas não estão dispostas a ajudar caso precise de ajuda (OR: 2.11, 95%CI: 1.02 – 4.36). A autopercepção de estresse, o consumo de álcool e o fumo não se associaram aos sintomas clínicos de depressão. O capital social desempenha um papel importante na explicação dos sintomas depressivos entre os universitários brasileiros. O estudo sugere que promover confiança e aumentar a participação nas redes sociais pode ser uma estratégia importante para a promoção da saúde mental entre os universitários investigados neste estudo.*

Palavras-chave *Sintomas depressivos, Estudantes, Capital social, América Latina*

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Introduction

Mental health problems among Brazilian university students pose a critical public health concern. A recent study found that 30% of students suffered from depression and nearly 63% had anxiety¹. For many young people, the years between 18 and 30 are characterized by important life changes. It is a transition from the dependency of an adolescent to the independence of a young adult. It is a phase which is marked by increased autonomy (e.g., leaving the parents' home), a variety of possible life directions to be chosen, and new social and academic responsibilities and for many students this period coincides with the years dedicated to their education^{2,3}. The uncertainties and the emotional pressure that possibly come as a consequence have been proposed as a risk factor for depression, anxiety, and stress^{2,4}.

Depression often manifests in a wide array of symptoms such as exhaustion, poor concentration, anxiety, disinterest in everyday activities and abandonment of university courses⁵. For many students, it also correlates with poor academic achievements and dropping-out⁶. Most mental disorders commence and manifest during the university age, with negative consequences on adult life such as poorer career prospects and social relationships. Thus, identifying factors that may contribute to depressiveness in university students is imperative.

College students stand out as a vulnerable group to develop depressive symptoms because they find themselves in an environment with high social expectations and academic demands^{7,8}. The choice of a profession is accompanied by high positive expectations of how these choices will translate into day to day. This optimism encompasses aspects of education, from activities they hope to develop throughout the course, the institution's infrastructure, curriculum, faculty, friendships and preparation for previous study. However, in most cases, these are expectations that are not grounded in reality, in which the student faces excessive activities, the professional activity is not what they expected, conflicts with other students and / or teachers, difficulty in adapting to different forms of education, and in some cases to a new home. Thus, when positive expectations are not met, this may lead to demotivation, a pessimistic view of the future and possibly developing depressive symptoms. Consequently, adapting to university life is not an easy process and the repercussions of this process, which can often lead to academic failure, go

beyond the area of education and directly affect the health of the individual and the community⁷.

In Brazil, most research investigating college students' health has focused on lifestyle behaviors such as the longitudinal studies Monisa and Eleseu^{10,11}. Monisa focuses on characterizing college students' lifestyle (e.g., physical activity) and Eleseu assess perceived stress, depression, body image, among other factors related to lifestyle among this group^{10,11}. Other factors related to college students' lifestyle like smoking and alcohol use, drug use and socio-demographic correlates are also discussed, but relatively little is known about wider social determinants of health such as social capital^{12,13}. Social capital defined by Putnam (2001) as *features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit*, has been proposed to be a determinant of health given its association with lower levels of stress, more favorable health-related behaviors and better self-rated and mental health¹⁴⁻¹⁷. Over the years the conceptualization of social capital has developed and the various theoretical definitions of social capital have led to the distinction between different dimensions of social capital. Structural and cognitive social capital are two prominent dimensions in health research. While structural social capital refers to links between people, cognitive social capital refers to the level of trust and reciprocity. The ways in which social capital can influence health are manifold. One possibility through which social capital may mitigate adverse effects on mental is through the provision of mutual psychological support. In the university context the association between levels of social capital on mental health has barely been discussed.

In our previously published cross-national study we found that estimates for clinically relevant depressive symptoms were highest among students from Brazil¹⁸. We also found that overall lower levels of social were associated with poorer mental health¹⁸. However, it was out of scope of our cross-national study to analyze which specific individual social capital indicators account for depressive symptoms among Brazilian college students. Nevertheless, given that mental health problems among students have increased in number and severity and pose a challenge for higher education institutions and health services, exploring pathways that can mitigate adverse effects on mental health remain of great importance. Therefore, this study aimed to investigate which specific individual social capital indicators

account for depressive symptoms among Brazilian college students.

Methods

The data analyzed in this paper are from the SPLASH (Social capital and students' health) study, an international two-wave panel study¹⁸. The present study utilized data collected in Brazil from May to October 2018. Participation in the survey was voluntary and anonymous via a self-administered questionnaire distributed during lectures. The questionnaire was compiled of previously published and validated instruments used in various populations. Students that agreed to participate signed a consent form before data collection. Prior to filling out the survey, students were informed that they could terminate their participation at any time and did not have to answer questions they feel uncomfortable with.

Sample size

Based on a 95%CI, a +5% margin of error and an estimated prevalence of depressive symptoms of 30.0% among university students, the minimum sample size required for this study was 317 students. Adjusted for 30% of incomplete responses, missing data, and rejection rate, the final minimum required sample size was 452 students.

Ethical considerations

Permission for conducting the study was granted by the Institutional Review Board from the University Center of the Federal District (approval number: 59713316.0.0000.5650). All proposed and approved ethical procedures were strictly followed by the investigators.

Measures

Depressive symptoms

Depressive symptoms were assessed by using the simplified Beck Depression Inventory (BDI-S)¹⁹. The simplification of the original BDI included two approaches: (a) the four items per symptom that assessed the specific symptom's intensity in the original BDI were replaced by a single statement per symptom with a six-point Likert scale (0 = 'Never' to 5 = 'Almost Always'); and (b) the symptom that assessed loss of weight was excluded. Sample items include: "I feel sad,"

"I feel I am being punished," "I have thoughts of killing myself." Based on respondents' answers, a single score can be computed, which can range from 0 to 100, with a score higher than 35 suggesting that clinically relevant depressive symptoms are present^{19,20}. The Cronbach's alpha in the present study was acceptable with $\alpha=0.75$.

Social capital

Items of the World Bank Integrated Questionnaire to Measure Social Capital (SC-QI), a psychometrically validated questionnaire, were used to assess social capital²¹. This questionnaire originally has 27 items and is divided into six different dimensions of social capital, a) groups and network, b) trust and solidarity, c) collective action and cooperation, d) information and communication, e) social cohesion and inclusion, f) empowerment and political action. Since the SC-QI has no overall scoring algorithm. Thus, for this study, 13 items out of the 27 items were chosen. This was done with the help of an expert on social capital and health studies. Furthermore, the selection was based on social epidemiological evidence and the peculiarities of the university students. The remaining items of the SC-QI were deemed as irrelevant for the purpose of this study and were therefore excluded. The behavioral dimensions of social capital, for example, were measured by questions inquiring about: Time or money contributed to a community project, participation in community activity and frequency of meeting friends. The cognitive dimensions of social capital were assessed by questions focused on ability to borrow money, perceived helpfulness of others, and trust in other people.

Confounding variables

Potential confounding factors included sociodemographic factors and an individual-level factors associated with depressive symptoms. Specifically, data were obtained on the following variables: age, sex, family socioeconomic status (e.g., parental level of education and employment, perceived level of income), perceived stress and smoking. Perceived stress was measured by Cohen's Perceived Stress Scale (PSS), which includes ten questions, with answers ranked using a five-point Likert scale (0 = 'Never' to 4 = 'Very often') and assesses the perception about stressful experiences over the previous four weeks²². High scores on each scale indicate more stress. Based on the scoring respondents can then be grouped into one of the following three categories: low stress (score: 0-13), moderate stress (14-26), high

stress (27-40). The Cronbach's alpha was high ($\alpha=0.71$). Smoking status was assessed by asking students whether they were current smokers and if not if they had ever tried a cigarette.

Conceptual model

A considerable amount of research on social capital and health is available. To contribute to the theoretical structure of this research, we have developed a conceptual model of the individual-level social capital process on individual health outcomes to explain the connection between individual factors, social capital, and student's mental health. The elements of the conceptual framework were drawn from a review of public health literature that addressed social capital (Figure 1).

Individual factors

Individual factors consist of socio-demographic factors including age, sex, and socioeconomic status (SES). Socio-demographic factors are strongly related to health²³. While good health is more commonly found among those with a higher SES, those of lower SES die younger and suffer a greater burden of disease and disability²⁴.

Health risk factors

Excessive alcohol consumption, smoking, and physical inactivity are included in the component of health risk factors. Cumulative evi-

dence has shown strong relationships between depression, alcohol consumption, smoking, and physical activity^{25,26}.

Social capital

The main component in the model, and this study is social capital. Broadly, social capital includes, for instance, the availability of social support and involvement in social networks²⁷. This involvement can, for example, be participation in a religious organization or sports club. Research has shown that social capital can have beneficial effects on mental health²⁷.

Data analysis

As a first step, basic descriptive statistics, including chi-square tests for categorical variables and independent-sample t-tests for continuous variables, were performed. Next multivariate logistic regression analyses, with depressive symptoms as the dependent variable, were performed. Two models were run. The first model adjusted for socio-demographic variables (e.g., age, sex, parental level of employment). The second model was the same as model 1 but added other potential confounders (e.g., smoking habit and perceived stress). All analyses were performed using SPSS statistical software for Windows version 25.0 (SPSS, Inc., Chicago, IL). The significance level was set at $p<0.05$.

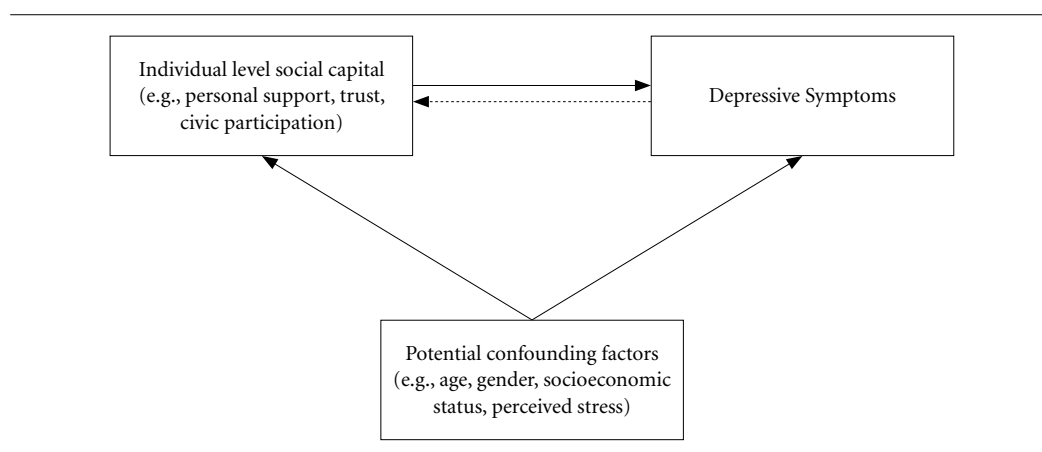


Figure 1. Caption: Conceptual model of individual level social capital processes on individual health.

Legend: The dotted and solid arrows demonstrate the assumption of a causal relationship between social capital, individual factors and health risk factors. The causal relationship can go both ways. Specifically, social capital may influence health, but health may also influence social capital.

Source: Authors.

Results

Descriptive statistics for socio-demographic characteristics, depressive symptoms, and social capital are reported in Table 1. The sample consisted of 579 Brazilian university students, with a mean age of 23.11 (SD: 3.46) and the majority being female (66.3%). The respondents were from different fields of study with the majority from the biological sciences field (45.3%). Most students came from a family with a low socioeconomic status, with many parents working part-time only (57%) or unemployed (23%). Students predominantly lived in their parents' house (58.2%) and most felt like they did not have enough income to cover their monthly costs (59.2%) (Table 1). As outlined in our cross-national study, clinically relevant depressive symptoms (BDI-S >35) were found in 86% of the respondents (Table 1)¹⁸.

Factors associated with depressive symptoms

Significant associations, instead, were found for perceived income (i.e., income is enough to cover costs) ($p=0.001$) as well as three of the cognitive social capital indicators (Someone is likely to take advantage of you, $p=0.029$; People are willing to help you, $p=0.025$; People are eager to collaborate to solve a problem, $p=0.003$). Perceived stress ($p=0.746$), hazardous alcohol consumption ($p=0.212$) and smoking ($p=0.962$) instead were not associated with clinically relevant depressive symptoms (Table 1).

Results of the binary logistic regression analysis are shown in Table 2. The first step of multivariable-adjusted binary logistic regression (Model I) was controlled for demographic (age, gender) and socioeconomic variables (parental level of education and employment, perceived

Table 1. Sociodemographic and social capital factors and prevalence of depressive symptoms in university students in a public university.

Characteristics	Total Sample N (%) [*]	Not clinically relevant depressive symptoms N (%) ^{**}	Clinically relevant Depressive symptoms N (%) ^{**}	p-value
Mean Age (\pm SD)	23.11 (3.46)	23.30 (3.09)	23.07 (3.52)	0.578
Gender				
Males	195 (33.7)	29 (14.9)	166 (85.1)	0.482
Females	384 (66.3)	49 (12.8)	335 (87.2)	
Living during term time				
Parent's house	337 (58.2)	47 (13.9)	290 (86.1)	0.693
Relative's house	242 (41.8)	31 (12.8)	211 (87.2)	
Perceived level of income: Income is enough to cover costs				
Agree	236 (40.8)	17 (7.2)	219 (92.8)	<0.001
Disagree	343 (59.2)	61 (17.8)	282 (82.2)	
Study program				
Human Sciences	208 (38.4)	24 (11.5)	184 (88.5)	0.441
Biological Sciences	245 (45.3)	33 (13.5)	212 (86.5)	
Exact Sciences	88 (16.3)	15 (17.0)	73 (83.0)	
Smoking				
Ever-smoker	162 (28)	22 (13.6)	140 (86.4)	0.962
Never-smokers	417 (72.0)	56 (13.4)	361 (86.6)	
Alcohol consumption				
Non-hazardous drinking	428 (78.0)	34 (7.9)	394 (92.1)	0.212
Hazardous drinking	121 (22.0)	14 (11.6)	107 (88.4)	
Perceived level of stress				
Moderate	569 (98.3)	77 (13.5)	492 (86.5)	0.746
High	10 (1.7)	1 (10.0)	9 (90.0)	

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Table 1. Sociodemographic and social capital factors and prevalence of depressive symptoms in university students in a public university.

Characteristics	Total Sample N (%)*	Not clinically relevant depressive symptoms N (%)**	Clinically relevant Depressive symptoms N (%)**	p-value
Social Capital: Cognitive Dimension				
Borrow money				
Yes	329 (56.8)	49 (14.9)	280 (81.1)	0.250
No	250 (43.2)	29 (11.6)	221 (88.4)	
Someone is likely to take advantage of you				
Disagree	143 (24.7)	27 (18.9)	116 (81.1)	0.029
Agree	436 (75.3)	51 (11.7)	385 (88.3)	
Trust				
People can be trusted	288 (49.7)	40 (13.9)	248 (86.1)	0.770
You can't be too careful	291 (50.3)	38 (13.1)	253 (86.9)	
People are willing to help you				
Yes	447 (77.2)	67 (15.0)	380 (85.0)	0.025
No	132 (22.8)	11 (8.3)	121 (91.7)	
People are willing to collaborate to solve a problem				
Very likely	168 (29.0)	35 (20.8)	133 (79.2)	0.003
Somewhat likely	284 (49.1)	34 (12.0)	250 (88.0)	
Neither likely nor unlikely	43 (7.4)	5 (11.6)	38 (88.4)	
Somewhat unlikely	84 (14.5)	4 (4.8)	80 (95.2)	
Social Capital: Behavioral Dimension				
Time contribution to a community project				
No	185 (32.0)	20 (10.8)	165 (89.2)	0.199
Yes	394 (68.0)	58 (14.7)	336 (85.3)	
Money contribution to a community project				
No	367 (63.4)	54 (14.7)	313 (85.3)	0.249
Yes	212 (36.6)	24 (11.3)	188 (88.7)	
Communal activities past 12 months				
Yes	389 (67.2)	51 (13.1)	338 (86.9)	0.716
No	190 (32.8)	27 (14.2)	163 (85.8)	
Belonging to a group				
Yes	175 (30.2)	21 (12.0)	154 (88.0)	0.495
No	404 (69.8)	57 (14.1)	347 (85.9)	
Getting together for food or drinks				
Frequently	208 (35.9)	28 (13.5)	180 (86.5)	0.996
Rarely	3717 (64.1)	50 (13.5)	321 (86.5)	
Had visits from people				
Frequently	207 (35.8)	25 (12.1)	182 (87.9)	0.464
Rarely	372 (64.2)	53 (14.2)	319 (85.8)	
Visited people				
Frequently	202 (34.9)	27 (13.4)	175 (86.6)	0.957
Rarely	377 (65.1)	51 (13.5)	326 (86.5)	
Ability to make decisions that change the life course				
Able to make decision	268 (46.3)	39 (14.6)	229 (85.4)	0.480
Unable	311 (53.7)	39 (12.5)	272 (87.5)	

*Column percentage; **Row percentage

Source: Authors.

level of income). Model II controlled for other possible confounding factors (smoking and perceived stress). Three of the five indicators of the cognitive, social capital dimension were significantly associated with clinically relevant depressive symptoms (BDI-S >35). According to the bivariate logistic regression analysis, the odds of having depressive symptoms were significantly higher in students who agreed that someone was likely to take advantage (OR: 1.81, 95%CI:

1.03 – 3.17) and in students who reported that people are not willing to help if needed (OR: 2.11, 95%CI: 1.02 – 4.36). Students who stated that people are not willing to collaborate to solve a problem such as bullying were three times more likely to report depressive symptoms than a student who indicated that people are likely to collaborate (OR: 3.10, 95%CI: 1.05 – 9.17). Concerning the behavioral dimension of social capital, only one out of the seven indicators yielded

Table 2. Binary Logistic regression models for socio-demographic variables and social capital indicators with depressive symptoms .

Variable	Model I		Model II	
	OR	[CI 95%]	OR	[CI 95%]
Age	0.78	(0.43 – 1.41)	0.97	(0.43 – 1.41)
Gender				
Male (ref)	1.00		1.00	
Female	1.37	(0.80 – 2.36)	1.39	(0.80 – 2.36)
Level of education mother				
University Degree (ref)	1.00		1.00	
High School	1.57	(0.93 – 2.66)	1.47	(0.93 – 2.66)
Level of education father				
University Degree (ref)	1.00		1.00	
High School	1.46	(0.86 – 2.47)	1.58	(0.86 – 2.47)
Level of employment mother				
Full-time (ref)	1.00		1.00	
Part-time	1.04	(0.56 – 1.93)	1.02	(0.56 – 1.93)
Level of employment father				
Full-time (ref)	1.00		1.00	
Part-time	1.02	(0.54 – 1.92)	1.01	(0.54 – 1.92)
Not working for pay	0.67	(0.36 – 1.25)	0.67	(0.36 – 1.25)
Perceived level of income: Income is enough to cover costs				
Disagree (ref)	1.00		1.00	
Agree	0.34	(0.18 – 0.62)	0.34	(0.18 – 0.62)
Social Capital: Cognitive Dimension				
Borrow money				
Yes (ref)	1.00		1.00	
No	1.13	(0.64 – 1.98)	1.10	(0.64 – 1.91)
Someone is likely to take advantage of you				
Disagree (ref)	1.00		1.00	
Agree	1.81	(1.03 – 3.17)	1.78	(1.02 – 3.13)
Trust				
People can be trusted (ref)	1.00		1.00	
You can't be too careful	1.10	(0.66 – 1.83)	1.09	(0.66 – 1.82)
People are willing to help you				
Yes (ref)	1.00		1.00	
No	2.11	(1.02 – 4.36)	2.12	(1.02 – 4.40)
People collaborate to solve a problem				
Likely (ref)	1.00		1.00	
Unlikely	3.10	(1.05 – 9.17)	3.10	(1.05 – 9.20)

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Table 2. Binary Logistic regression models for socio-demographic variables and social capital indicators with depressive symptoms .

Variable	Model I		Model II	
	OR	[CI 95%]	OR	[CI 95%]
Social Capital: Behavioral Dimension				
Time contribution to a community project				
No (ref)	1.00		1.00	
Yes	0.78	(0.43 – 1.43)	0.79	(0.43 – 1.44)
Money contribution to a community project				
No (ref)	1.00		1.00	
Yes	1.55	(0.89 – 2.72)	1.54	(0.88 – 2.70)
Communal activities past 12 months				
Yes (ref)	1.00		1.00	
No	0.85	(0.49 – 1.49)	0.80	(0.47 – 1.37)
Belong to a group				
Yes (ref)	1.00		1.00	
No	2.21	(1.25 – 3.29)	2.19	(1.22 – 3.13)
Getting together for food or drinks				
Frequently (ref)	1.00		1.00	
Rarely	1.15	(0.66 – 1.99)	1.16	(0.71 – 1.25)
Had visits from people				
Frequently (ref)	1.00		1.00	
Rarely	1.06	(0.83 – 1.36)	1.06	(0.83 – 1.35)
Visited people				
Frequently (ref)	1.00		1.00	
Rarely	1.14	(0.89 – 1.45)	1.35	(0.90 – 1.44)
Ability to make decisions that change the life course				
Yes (ref)	1.00		1.00	
No	1.28	(0.76 – 2.17)	1.26	(0.75 – 2.13)
Perceived Stress				
Moderate (ref)			1.00	
High			1.06	(0.12 – 8.97)
Smoking				
Ever (ref)			1.00	
Never			1.00	(0.57 – 1.78)

Source: Authors.

a statistically significant result. A student who indicated to not to belong to a group such as a sports club had a significantly higher likelihood to report clinically relevant depressive symptoms (OR: 2.21, 95%CI 1.25 – 3.29). Nonetheless, although the other indicators were not statistically significant, they were in the expected direction. As such, that low social capital increased the likelihood of depressive symptoms. For example, meeting friends only rarely increased the risk of clinically depressive symptoms by 15% (OR: 1.15, 95%CI 0.66 – 1.99). Likewise, students who indicated that they were unable to make an important decision that could change their course of life were 28% more likely (OR: 1.28, 95%CI:

0.76 – 2.17) to show signs of clinically relevant depressive symptoms. No statistically significant evidence was found that smoking status and perceived stress were associated with depressive symptoms in university students.

On behalf of all authors, the corresponding author states that there is no conflict of interest

Discussion

The objective of the present study was to test the association between specific social capital indicators and depressive symptoms among Brazilian university students. Approximately 7 out of 10

students reported clinically relevant depressive symptoms. This is significantly higher than the prevalence found among the general population (3% to 14%) and Brazilian undergraduate students (4%)²⁸. It is also significantly higher than the prevalence of depressive symptoms measured among university students in other countries such as Canada (38.2% to 46%), Bosnia (30.1%) and Turkey (26.2%)²⁹. The research conducted by Aragão *et al.*, in universities in Sergipe, Brazil, with 215 students aged 19 to 24 years, identified a prevalence of 29.7% of depressive symptoms³⁰. Contributing to these findings, similar data were found by Jaalouk *et al.*, in a study conducted in Lebanon, with 457 undergraduate students, aged 18 to 33 years, in which 24.1% had depressive symptoms³¹.

A survey conducted in 100 Brazilian higher education institutions in the 27 state capitals, with 12.711 university students aged between 17 and 31 years showed that 79.9% of participants answered having at least one depressive symptom (i.e., exposed mild depressive symptoms)³¹. This high rate corroborates with our findings. University students stand out as a population at risk for high prevalence of depressive symptoms, since they need to adapt to a new reality quickly, as entry to the higher level makes many need to leave their homes and to go to different places, in addition to long commutes, academic failure and overworked periods of work and tests, which creates dissatisfaction and increases in stress levels.

Moreover, our findings showed that low levels of trust (e.g., people are willing to help) and not reporting collective actions (e.g., people collaborate to solve a problem) are associated with depressive symptoms, also after adjustment of all other social capital indicators and other possible confounders. Students who believed that people are likely to take advantage of them and students who believed that people are not willing to help had a higher likelihood of reporting clinically relevant depressive symptoms. Similarly, students who did not belong to a group were more likely to report clinically relevant depressive symptoms. The findings are somewhat similar to those found in a previous study investigating social capital and self-rated health among Brazilian adolescents. Borges and colleagues (2010) examined the association between social capital and self-rated health among youth³². Their results suggest that adolescents with low social support and little trust had a greater likelihood to report poor health. Cumulative evidence from public health studies among adults and elderly has also

suggested that low levels of social capital were significantly associated with poor mental health status, including depression^{24,33}.

We cannot exclude that certain contextual factors, such as the country's political and economic moment of crisis, might have influenced the observed results. In particular, because similar to the findings of Borges and colleagues (2010), the majority of students sampled (75.3%) agreed that someone is likely to take advantage of them. The capacity to trust might be influenced by Brazil's current political upheaval³². Overall, our findings are in line with previous research. Lower levels of trust have been linked to poorer health^{32,34}. Han *et al.* (2018), for instance, found that older adults with a low level of interpersonal trust were at greater risk for depressive symptoms compared to those with higher levels of trust^{32,33}. Research utilizing a sample from Russia established that greater trust was associated with improved emotional as well as physical health³⁴. Already 20 years ago Kawachi and Berkman highlighted the importance of social networks and social bonds for mental health³⁵. The researchers proposed that social bonds such as friends or family may offer resources for emotional and informational support, especially during high-stress periods, which can have a positive effect on mental health³⁵. The authors also point out that being integrated into a social network may strengthen a sense of purpose, belonging, security, and a recognition of self-worth exerting a salutary influence on mental health³⁵.

Generally, it is important to realize that university students represent a particular part of the population. Poor health during academic years can have important implications for their future well-being and occupational success³⁶. The college years are stressful and make the late teens and twenties a particularly vulnerable time. It is important to recognize that in the case of Brazil; it may be worse given the uncertain economic and political times. The literature shows that answering to the psychological needs of university students through intervention proposals is still scarce³⁷. However, when such interventions happen (within the scope of school services, extension projects or university management actions) they are important tools for the development of professional and interpersonal skills, in addition to promoting career guidance and health promotion and contributing to reducing academic failure.

A comprehensive national report, published in 2019, addressing the cultural and socio-eco-

nomie profile of 424,128 undergraduate Brazilian students, enrolled in public higher education Institutions, pointed out that 83% of the students reported having some mental health distress. The fact that this report was an initiative from the National Association of leaders of Brazilian public higher education institutions shows an effort that student's mental health should be among the priorities for informed decisions at the Universities and Colleges³⁸.

This high prevalence of depressive symptoms among university students reveals the importance of implementing services, especially within Higher Education Institutions (HEIs), which aim to facilitate the integration of students into academic life and to optimize their physical and psychological well-being³⁹. The activities developed by these services do not necessarily need to be characterized by individual clinical care, it is expected that psychologists working in HEIs are prepared to deal with group demands, but know how to identify the need to develop individual actions, which depends on the situation experienced by each student³⁹.

The university attendance services were created with the purpose of providing social, economic, physical and psychological assistance to academics³⁷. The National Union of Students (UNE) describes student assistance as the set of policies that aim to guarantee the reduction of socioeconomic and cultural inequalities, the fight against dropout and the promotion of a complete, equal education to all students³⁹. Assistance must provide basic conditions for the university student to remain in the institution, ensure the means necessary for full academic development and contribute to the improvement of the university system⁴⁰. Assistance practices in university attendance services are often focused on actions related to housing, food and transportation. Possibilities such as the Student House, the University Restaurant, the receipt of scholarships and the payment of half of the bus ticket or exemption from this fee are essential assistance services for academic permanence and the conclusion of graduation³⁹. It is important to highlight that 68.1% and 40.3% of Brazilian university students has a job while attending college; among these working students, 72% received up to R\$2,090 Reais [+/- U\$758.53; reference July 2019]⁴⁰. However, there is still a small number of universities in which actions are taken or planned to meet the mental health needs or to adjust to the academic life of university students³⁷. In fact, most HEIs have little concern with preparing individuals for

the changes that occur after high school. The offer of programs that favor the psychosocial adaptation of students is limited and mental health does not receive due attention in higher education despite the increase in the prevalence and severity of psychological problems among university students³⁹. Due to this scenario, some universities in Brazil, such as the University of São Paulo (USP), have established a Mental Health Office, while the Federal University of Santa Catarina (UFSC) provides assistance to the community through the Psychological Attention Service (SAPSI).

We also have the Life Valuation Center (CVV) with the objective of providing emotional support and preventing suicide. Provided by the National Mental Health Policy, Psychosocial Care Centers (CAPs) provide services of an open and community nature. In CAPs, the population finds a team formed by professionals from different areas and prepared to deal with more serious and persistent cases⁴¹. Universities end up giving support to students through extension projects, by offering psychological attention to the university student in different support services⁴². These interventions can assist in facing the countless challenges experienced in the trajectory of higher education, and assist in minimizing psychological illness and promoting the student's mental health⁴². However, despite the number of students benefited, the actions are still quantitatively insufficient to cover all the needs of the academic population³⁷. Thus, new interdisciplinary projects must be proposed in order to meet the entire academic community that seeks psychological care services.

Strengths and limitations

A series of limitations apply to this study. First, as we used a cross-sectional approach, we cannot establish the direction of the associations studied. Potential bi-directionality of the associations could go either way. Second, since the study was a snapshot and included first-year university students. Therefore, our understanding of when in the academic year, risk for depression is greatest and when interventions may be most needed is limited. Third, data were obtained with self-reported questionnaires; due to that, responses could be exaggerated or downscaled. Although the BDI-S is an immensely utilized instrument for detecting depression and clinically relevant depressive symptoms, it remains a screening and not a diagnostic tool. A clinician report or semi-structured interviews may have led to more

accuracy. Students may have answered differently in the presence of another person. Fourth, the study participants were limited to Brasilia, one district of Brazil; therefore, our results might not apply to the general college student population. Despite these limitations, the present study offers important findings as it was the first study to investigate the association between specific social capital indicators and depressive symptoms among Brazilian university students. Until now, the vast majority of the studies on mental health in Brazilian academia were related to factors such as academic workload, stress and lifestyle behaviors³⁶. Therefore, the present study presents a new pathway for specific prevention measures and interventions in the university context.

Conclusion

Factors significantly associated with depressive symptoms were low levels of social capital. This implies that enhancing social capital should be a prime target for prevention programs aimed at supporting student mental health. However, it is possible that the further contextual factors lead to elevated levels of depressive symptoms among university students. Future research should have a longitudinal design and should also investigate contextual factors to better understand factors of depressive symptoms and how social capital can affect depressive symptoms.

Collaborations

I Backhaus and AR Varela conceived and designed the study. AP Baer and I Backhaus analyzed the data. I Backhaus, C Borges, AP Baer, and AR Varela wrote the manuscript. All other authors have contributed to manuscript editing and provided critical feedback.

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