









Analysis of the social support network for university students during the Covid-19 pandemic

Análise da rede social de apoio de estudantes universitários na pandemia de Covid-19

Análisis de la red de apoyo social de los estudiantes universitarios durante la pandemia de Covid-19

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ABSTRACT

Objective: to identify the social support network for students from a Brazilian **public** university during the Covid-19 lockdown period. **Method:** observational, cross-sectional study based on social network analysis. Participants were undergraduate students at a university. Data collection took place between May and December 2021 through an online form. The analysis was carried out using the Gephi[®] software. **Results:** 969 individuals participated in this study. The highest degrees of centrality were found respectively in the following options: family (0.572), friends (0.552) and mother (0.551), however, the inclusion of other actors in the network was also observed such as religion (0.074) and the figure of the therapist (0.098). **Final considerations:** it is hoped that this investigation may support new debates about the university's role in the maintenance of the students' social support network, given the fact that, even in a context of crisis, the institution was not recognized AS part of the students' network.

Descriptors: Universities; Students; COVID-19; Social Network Analysis.

RESUMO

Objetivo: identificar a rede social de apoio de estudantes de uma universidade pública brasileira durante o período de bloqueio da Covid-19. **Método:** estudo observacional, transversal baseado na análise de redes sociais. Os participantes foram estudantes de graduação de uma universidade. A coleta de dados ocorreu entre maio e dezembro de 2021 através de um formulário online. A análise foi realizada com o uso do software Gephi[®]. **Resultados:** participaram deste estudo, 969 indivíduos. Os maiores graus de centralidade foram encontrados respectivamente nas opções: família (0.572), os amigos (0.552) e mãe (0.551), entretanto, observou-se também a inserção de outros atores na rede, como a religião (0.074) e a figura do terapeuta (0.098). **Considerações finais:** espera-se que esta investigação possa subsidiar novos debates sobre o papel da universidade na manutenção da rede social de apoio dos estudantes, já que, mesmo em contexto de crise, a instituição não foi reconhecida COMO parte da rede estudantil.

Descritores: Universidades; Estudantes; COVID-19; Análise de Rede Social.

RESUMEN

Objetivo: identificar la red de apoyo social de los estudiantes de una universidad pública brasileña durante el confinamiento por Covid-19. **Método:** estudio observacional, transversal, basado en el análisis de redes sociales. Los participantes eran estudiantes universitarios de una universidad. La recolección de datos se realizó entre mayo y diciembre de 2021 a través de un formulario *online*. El análisis se realizó utilizando el *software* Gephi[®]. **Resultados:** Participaron 969 personas en este estudio. Los mayores grados de centralidad se encontraron respectivamente en las opciones: familia (0,572), amigos (0,552) y madre (0,551), sin embargo, también se observó la inclusión de otros actores en la red, como la religión (0,074) y la figura del terapeuta (0,098). **Consideraciones finales:** se espera que esta investigación pueda propiciar nuevos debates sobre el papel de la universidad para mantener la red social de apoyo de los estudiantes, ya que, incluso en un contexto de crisis, la institución no fue reconocida COMO parte de la red estudiantil.

Descriptores: Universidades; Estudiantes; COVID-19; Análisis de Redes Sociales.

INTRODUCTION

During the period of the Covid-19 pandemic, especially between 2020 and 2022, the sanitary conditions we experienced pointed to the need for physical distancing measures aimed at containing the transmission of the virus, and the process of adapting to this new reality affected the university scenario. Higher education institutions (HEIs) had to quickly develop and implement non-contact teaching-learning models¹. This process had a significant impact on academic activities and socialization², leading to burden, stress, mental distress and dissatisfaction³.

Study as part of the research projec "Salutogênese e vigilância a saúde do trabalhador com ênfase em instituições de ensino superior em período pós-pandêmico", financed in part by the Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro – Brazil (FAPERJ), Call E_26/2021 – basic research assistance (APQ1) in state's ICT UERJ, UENF e UEZO - 2021, Process SEI-260003/015471/2021 - APQ1.

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Specifically in the student scenario, the Covid-19 pandemic had repercussions on their physical^{4,5} and mental^{6,7} health, as well as to their lifestyle habits^{8,9}. However, it is observed that the social relationships established during this period can be viewed as a protective factor². In this sense, activating the social support network is essential for maintaining basic sociability, in addition to establishing interactions of affection and cooperation¹⁰.

Social support is the relationship established between recipients and providers, whether verbally or non-verbally, that can help reduce uncertainties about a certain situation or individual, especially – but not only – during times of crisis^{11,12}.

It is important to highlight that during the Covid-19 lockdown period, these social support networks were obviously adjusted, whether by virtualizing the relationships or even by including new elements to this network such as institutional actors and strategic coping support methods that do not necessarily establish social connections such as leisure facilities².

The virtualization of individuals' social support network is a phenomenon that goes hand in hand with the social and communicational transformations experienced in the 21st century. Messaging platforms, social media and virtual reality applications are increasingly used and associated with the creation of identity support groups, in which the perception of emotional and social support is associated with well-being¹³.

Social support networks associated to the university population during the pandemic period revealed a positive relationship between the existence of social support and increased emotional well-being. A study carried out in South Africa identified that students' social support network managed to minimize symptoms of depression and hopelessness during the Covid-19 pandemic¹⁴. In a study carried out in China, it was observed that the social support network aimed at university students minimized the effects of anxiety and stress¹⁵. Furthermore, it was noted that the virtualization of the social support network did not have any influence on the students' mental health but became critical as a protective factor¹⁶.

Given the virtualization of academic activities and social networks during the Covid-19 pandemic, this work was developed with the aim of identifying the social support network for students from a Brazilian public university during the Covid-19 lockdown period.

METHOD

Observational and cross-sectional study outlined by the social network analysis methodology (SNA). The participants were undergraduate students from a public university located in the state of Rio de Janeiro.

Data collection was conducted between May and December 2021, a period in which participants carried out their academic activities entirely remotely. Initially, the participants were recruited to participate in the study via an electronic message sent at the institution's virtual learning environment; subsequently, the participants themselves spread the access link among their peers. Data collection was carried out remotely, using a virtual form hosted on the institution's own survey platform.

The inclusion criteria in this study were the following: being an undergraduate student regularly enrolled at the institution during the months of data collection; and having carried out at least one of the student activities remotely during the period of social isolation, whether teaching, research or extension.

SNA is a methodology originating from Cultural Anthropology and Sociology, applied to several disciplines whose analytical focuses are the relationships and interactions between individuals as a way of understanding the relational structure of society. More traditionally used in quantitative methods due to the need to measure patterns of relationships and the interrelationships of actors in a network configuration, the qualitative approach considers the actors' universe of meaning, which should not be reduced to the simple operationalization of variables, that is, it must deepen the universe of meaning of human actions and relationships¹⁷.

The data collection instrument included sociodemographic and professional variables and a question about social support and the pandemic period focused on the SNA. The central question asked to the students was: which individuals, public figures, things or institutions were part of your social support network during the Covid-19 lockdown period?

The lack of answers to this question resulted in withdrawal from the research, that is, automatic exclusion from the study. Participants provided up to five answers to this question. There was no pilot validation test, however, the evaluation of the question and the data analysis were carried out by three researchers and authors of the manuscript who have previous theoretical-practical experience in SNA.

We then chose to study the network as a 2-mode, from an ego-centered perspective. Two-mode network analysis generates centrality measures, where the most central interactions are those mentioned most frequently or those that stand out for each actor interviewed. These central changes are not necessarily part of the same total network and do not necessarily know each other¹⁵.

The analysis of the data obtained was carried out by making spreadsheets of the findings in the Microsoft Excel® software, version 2403. After building this database, the metrics were analyzed and the sociograms were constructed with the support of the Gephi *software*, version 0.10.1. In this program, the actors were represented by codes that typify course of attachment, gender and year of birth. It is also noteworthy that the size of the node is proportional to the degree of centrality that each actor mentioned has in the social network.

Regarding the metrics analyzed, we used: Degree centrality, closeness centrality and betweenness centrality. Degree centrality (degree) is related to the number of actor connections. In this study, the two-mode network is based on a bipartite graph. All paths in this type of graph consist of an alternating series of nodes and edges (actors and connections), with two sets of actors or vertices. In the bipartite graphs used in the analysis of 2-mode networks, the degree of centrality is determined by the number of connections originating from actors from another category or entity¹⁸, that is, in the analysis of these students' social support networks, the centrality was determined by the number of times each category was mentioned by the participants.

Closeness centrality is related to the distance between a given actor and other actors in the network. Therefore, actors with greater closeness centrality are closer to other actors in the network. In bipartite graphs, the minimum distance between one actor and another in the same set is 2, and the minimum distance between two actors in different sets is 1. In social support networks, actors with greater closeness centrality are closer to other participants, thus providing faster support¹⁸.

The betweenness centrality is related to the ability of actors to mediate information and actions in the network. Actors with greater betweenness centrality are more powerful to mediate information and network actions to support different actors in the network. The calculation of the betweenness centrality measure is based on geodesic paths, that is, the shortest paths between two actors. In bipartite graphs, paths can begin and end at either set of actors¹⁸.

This investigation is part of a broader research protocol that analyzed the lifestyle of an academic community during the Covid-19 isolation period and was previously evaluated and approved by the National Research Commission. Furthermore, we emphasize that the presentation of this manuscript followed the *Checklist for Reporting Results of Internet E-Surveys* (CHERRIES)¹⁹.

RESULTS

1,932 responses from undergraduate students were registered, however, only 969 students completed the instrument and were included as study participants. The distribution according to sectoral center was established as follows: that of the participating students can be found in Table 1.

Table 1: Distribution of students participating in the research. Rio de Janeiro, RJ, Brazil, 2021.

Sectoral Center	Gender (n)			Age (mean)
	Male	Female	Not reported	
Biomedical Center	17	82	1	23.84
Social Sciences Center	92	157	-	28.71
Education and Humanities Center	79	332	8	28.56
Technology and Science Center	108	102	1	24.90
TOTAL	296	663	10	26.50

The distribution reveals that students taking courses at the biomedical center were the least active in the research, even though they correspond to the university's demand for full-time degree programs, which can be translated as low student engagement in the activities proposed during emergency remote teaching. It is also observed

that the sectoral centers with the highest mean age among the students were those that had the highest numbers of participants in the research.

Table 2 presents the distribution ranking of the analyzed network's centrality measures.

Table 2: Centrality measures of students' social support network during the Covid-19 pandemic lockdown period. Rio de Janeiro, RJ, Brazil, 2021.

	Degree Centrality (<i>degree</i>)	Closeness Centrality (<i>closeness</i>)	Betweenness Centrality (<i>betweenness</i>)
Family	0.593	0.572	0.331
Friends	0.559	0.552	0.328
Mother	0.560	0.551	0.259
Father	0.308	0.433	0.065
Boyfriend/Girlfriend	0.279	0.422	0.073
Spouse	0.113	0.371	0.024
Hobbies	0.101	0.370	0.041
Therapist	0.098	0.369	0.018
Religion	0.074	0.362	0.013
Animals	0.051	0.355	0.010
Work	0.039	0.351	0.008
Individuality	0.017	0.347	0.006
Public Figures	0.012	0.342	0.002
Health professionals	0.009	0.342	0.002
Social media	0.008	0.341	0.000
Medications	0.003	0.327	0.000
Food	0.003	0.328	0.000
Alcohol	0.002	0.327	0.000
Illicit substances	0.001	0.324	0.000

It is evident that, from the students' perspective, family (0.572), friends (0.552) and mother (0.551) were the most important figures in their social support network during the period studied. Regarding degree centrality, these same actors were those who had the highest degree centrality, thus having a greater number of connections. Regarding betweenness centrality, the relevance of the same actors is observed, thus demonstrating a greater capacity to mediate information in a potential integrated network.

In relation to the social roles of the answers cited by the participants, the findings can be seen in the sociogram shown in Figure 1.

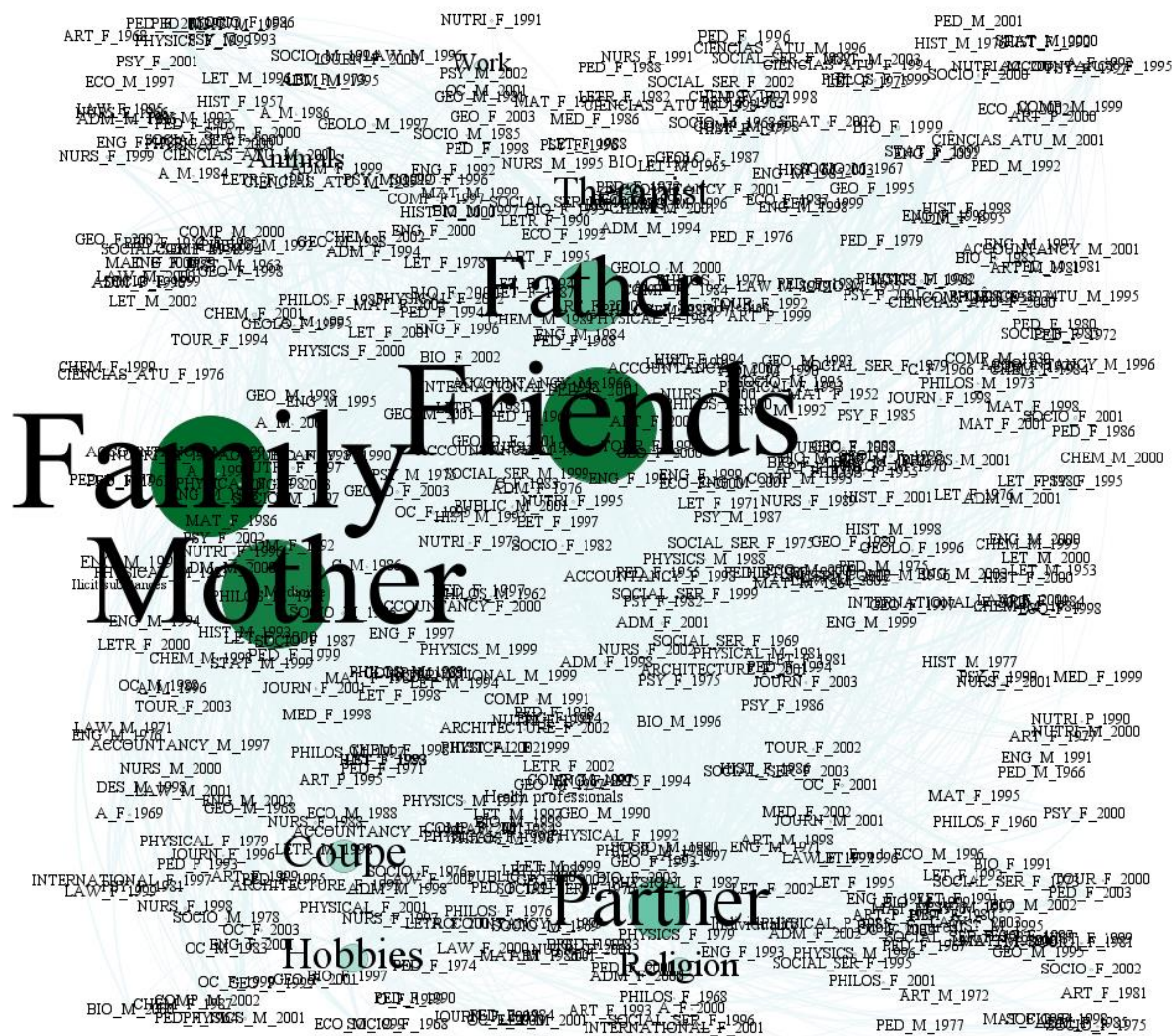


Figure 1: Sociogram of students' social support network during the Covid-19 pandemic. Rio de Janeiro, RJ, Brazil, 2021.

The networks highlight the social roles of different actors in coping with and providing social support to students during the Covid-19 pandemic. The role of the family, as a unit expanded beyond the nuclear aspects centered on the figures of the father and mother, is an aspect that draws attention. Furthermore, the presence of professional support points to the search for specialized support to face the pandemic period, especially during the social isolation stage.

DISCUSSION

Social networks can be identified as a strategy for analyzing the relationship between its actors, regardless of their personal, social, identity or legal characteristics, in which shared interests are the social fabric that strengthens interactions²⁰.

The concept of social networks must be understood as a resource capable of explaining the mobilizing potential of civil society and innovative political perspectives, strengthened by solidarity actions generated horizontally between individuals and social groups, within civil society, in the governments' spheres of power etc. In addition to focusing on the analysis of fixed social actors based on certain positions or statuses, it focuses its attention on the relationships themselves, in which the basic value of actions is aimed at the social relationship itself: its morphology, density, intensity and meaning²¹.

Studies on the analysis of social networks during the Covid-19 pandemic period have developed in a heterogeneous manner, ranging from analyzes focused on the identification of topics of interest to the population on social media^{22,23} to the analysis of connections established by individuals with Covid-19²⁴.

In the university scenario, the SNA was used for a variety of purposes, ranging from mapping the connections established by sick individuals²⁵ to identifying student leaders in the students' social network²⁶. However, sociological analyzes focused on the university support network are still scarce. Such information is essential as it can identify the main support roles and assist in the creation of network maintenance strategies, in addition to identifying individuals who are poorly connected and should possibly be the target of social support policies and actions.

Primary social networks can be understood as the interactions between individuals that recognize a broader dimension of collective obligation, such as family networks²⁷. It is exactly in this circle that closer relationships are generally found and bonds necessary for personal development are strengthened¹⁷.

Thus, it is possible to assume that family roles are relevant not only in a period of crisis, but in the students' psychosocial development itself and, in turn, in the process of adapting and coping with adverse situations such as entering and remaining at the university in a pandemic context^{28,29}.

Another social network element that, from the student's perspective, is central in mediating information and network actions to support them are their friends (0.552). It is observed in the scientific literature that the inclusion of individuals who are willing to establish relationships of trust in the personal social network is a beneficial aspect to the development and structuring of coping strategies in crisis scenarios, as well as to psychosocial strengthening^{30,31}.

In addition to individuals, other elements were also present in the students' social network such as faith and religion, whose fundamental role is related to the perception of feelings of resilience, hope, control maintenance and a sense of meaning to life. Religiosity, together with the implicit observance of rites and customs, strengthens the sense of belonging and purpose among students, promoting positive effects on their well-being during the pandemic^{32,33}.

Just like religiosity, hobbies and leisure activities have played a crucial role in the context of social distancing during the Covid-19 pandemic, constituting essential lifestyle elements that significantly contribute to the preservation of health. These practices are highly relevant in the students' development process, as they provide an opportunity for individuals to free themselves from their daily responsibilities and exercise their freedom. The positive psychological impact of these activities on students points to their therapeutic and clinical usefulness, thus allowing a gradual reversal of the negative effects of social isolation³⁴.

Furthermore, leisure is widely recognized as a fundamental component for cultivating emotional and spiritual well-being (ESWB), and there is a close connection between activities such as solitude, meditation and prayer and the concept of leisure, giving them an essential role in stimulating personal and ESWB growth³⁵. Other investigations corroborate this perspective, suggesting that leisure, when viewed as a spiritual dimension, may have a substantial impact on global health and serve as an effective coping strategy^{36,37}.

The inclusion of mental health professionals in students' social networks reveals the need for specialized support during the lockdown period. Faced with the pandemic context, the students themselves have engaged in an individual search for psychological and professional support, in an attempt to increase their potential and emotional skills in order to deal with the crisis³⁸.

Study limitations

The main limitation of this study refers to the fact that the data collection instrument remained available in a virtual environment together with another set of questions from the same investigation. The original instrument had an average completion time of ten minutes and the question related to the SNA was at the end of the instrument, which may have discouraged the participation of other students. Furthermore, as this was a virtual data collection in a time frame where many families were sharing their electronic devices, we believe in the possibility of selection bias, where the most vulnerable individuals may not have had a significant participation in the investigation.

FINAL CONSIDERATIONS

Considering the Covid-19 pandemic context and the limitations imposed on the maintenance of social ties, the strengthening of the students' primary network was observed, made up mainly of their extended family –

grandparents, uncles and aunts, cousins, siblings –, friends and mother. The inclusion of mental health professionals, hobbies, religiosity and faith in the support network could mean a possible search for resilient behavior or harm reduction regarding the emotional impairment caused by social isolation.

It is hoped that this investigation may support new debates about the university's role in the maintenance of the students' social support network, given the fact that, even in a context of crisis, the institution was not recognized as part of the students' network.

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Conceptualization, M.G.A.F.; methodology, T.F.S.; software, H.M.S.L.D. and T.C.S.R.; validation, M.G.A.F., T.F.S. and A.F.C.; formal analysis, C.N.D.A., A.F.C., G.L.M.N., A.L.S.P.; investigation, C.N.D.A., A.F.C., G.L.M.N., A.L.S.P.; resources, M.G.A.F.; data curation, T.F.J.; manuscript writing, C.N.D.A., A.F.C. and T.C.S.R.; writing – review and editing, M.G.A.F.; visualization, M.G.A.F., T.F.S., H.M.S.L.D., T.C.S.R., A.F.C., C.N.D.A., A.F.C., G.L.M.N. and A.L.S.P.; supervision, M.G.A.F. ; project administration, M.G.A.F.; funding acquisition, M.G.A.F. All authors read and agreed with the published version of the manuscript.