









Dating app use among university students: A mixed-methods study

Uso de aplicativos de relacionamento entre universitários: estudo de método misto

Uso de aplicaciones de citas entre estudiantes universitarios: estudio de métodos mixtos

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ABSTRACT

Objective: to analyze how university students use dating apps to find sex partners and factors associated with this practice. **Method:** a mixed-methods study conducted between 2021 and 2022 with university students from Paraíba by means of a structured questionnaire and semi-structured interviews. The research protocol was approved by the Research Ethics Committee. **Results:** the prevalence of dating app use was 49.5%. Female students, non-beneficiaries of any grant from the university and those attending courses in the health area were more likely to use apps. The following thematic categories emerged: Aspects associated with app use; Influence of friends and family members on dating app use; and Influence of using legal and illegal substances on the search for partners in apps. Data integration was presented in a Joint display. **Conclusion:** the main purpose of using dating apps is to have fun, influenced by social relations and by consumption of legal and illegal substances.

Descriptors: Young Adult; Universities; Student Health; Mobile Applications; Sexual Behavior.

RESUMO

Objetivo: analisar o uso de aplicativos de relacionamento para recrutar parceiros sexuais entre estudantes universitários e fatores associados. **Método:** estudo de método misto, realizado com universitários da Paraíba, entre 2021 e 2022, por meio de questionário estruturado e entrevista semiestruturada. Protocolo de pesquisa aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** a prevalência do uso de aplicativos de relacionamento foi de 49,5%. Estudantes do sexo feminino, que não recebem benefício da universidade e que fazem curso na área da saúde apresentaram maiores chances de utilizarem aplicativos. Emergiram as categorias temáticas: aspectos associados ao uso de aplicativos, influência dos amigos e familiares no uso de aplicativos de relacionamentos e influência do uso de substâncias lícitas e ilícitas na busca por parceiros. Integração dos dados apresentada por *Joint display*. **Conclusão:** o uso de aplicativos de relacionamento tem como principal intuito a diversão, influenciado pelas relações sociais e uso de substâncias lícitas e ilícitas.

Descritores: Adulto Jovem; Universidades; Saúde do Estudante; Aplicativos Móveis; Comportamento Sexual.

RESUMEN

Objetivo: analizar el uso de aplicaciones de citas para encontrar parejas sexuales entre estudiantes universitarios y los factores asociados a dicha actividad. **Método:** estudio mixto realizado con estudiantes universitarios de Paraíba entre 2021 y 2022, a través de un cuestionario estructurado y una entrevista semiestructurada. El protocolo de investigación fue aprobado por el Comité de Ética en Investigación. **Resultados:** la prevalencia del uso de aplicaciones de citas fue del 49,5%. Las estudiantes mujeres, que no reciben beneficios universitarios y que realizan cursos en el área de salud, fueron más propensas a usar aplicaciones. Surgieron las siguientes categorías temáticas: aspectos asociados al uso de aplicaciones, influencia de amigos y familiares en el uso de aplicaciones de citas e influencia del uso de sustancias legales e ilegales en la búsqueda de pareja. La integración de datos se llevó a cabo mediante *Joint display*. **Conclusión:** el objetivo principal del uso de aplicaciones de citas es la diversión, influenciado por las relaciones sociales y el uso de sustancias legales e ilegales.

Descriptores: Adulto Joven; Universidades; Salud del Estudiantes; Aplicaciones Móviles; Conducta Sexual.

INTRODUCTION

The current generation of young adults has grown up amid technological development, through the advent of the Internet and the creation of mobile devices, such as smartphones. Geolocation-based dating apps are increasingly popular among young people, considering the ease to find sex partners through oftentimes anonymous profiles. Such tools allow sharing instant messages, photographs and videos¹⁻⁴.

As a consequence of the unbridled use of these apps, many young individuals have adopted Risky Sexual Behaviors (RSBs). Among them, the main practices taken up by dating app users are multiple partners, low adherence

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to condom use and consumption of alcohol and other substances, as well as not mentioning their history of Sexually Transmitted Infections (STIs)^{5,6}.

The university population is mostly comprised by young adults. Combined with university admission, the transition from adolescence to adulthood can favor the practice of RSBs, considering the possibility of undergoing of new experiences, freedom granted by the parents and greater ease to consume alcohol and other substances⁷. Therefore, it is important to provide health education to the aforementioned population segment with a view to reducing the practice of RSBs.

In addition to technological development, another important milestone in defining new ways of relating was the novel Coronavirus Disease (COVID-19) pandemic declared in 2020. Considering the novel coronavirus transmission routes (predominantly through the respiratory tract), it was necessary to adopt non-pharmacological measures to prevent this infection. The main measure was physical distancing, with a view to containing viral spread⁸.

During the most intense physical distancing period, the Lockdown, it was necessary to reinvent the ways of relating in order to maintain social interaction. Screen use became frequent with the population at their homes, whether for contact with family members and friends or for finding sex partners. In this context, there was an increase in the number of users of various websites and apps, including dating apps, especially among young people⁹.

Given the new ways of relating that have been adopted in today's world and the growth in the number of dating app users driven by the COVID-19 pandemic, it is valid to conduct research on this topic, as the investigation of these variables is limited in Brazil. In this context, this study aims at analyzing how university students use dating apps to find sex partners and factors associated with this practice.

METHOD

This is a mixed-methods study with a Sequential Explanatory Design (SED) that was developed in four *campuses* of a public university from the state of Paraíba, Brazil, and built according to the recommendations set forth in the Strengthening The Reporting Guides of Observational Studies in Epidemiology (STROBE) and in the Consolidated Criteria for Reporting Qualitative Research (COREQ). This design enables collecting quantitative and qualitative data, with a view to promoting in-depth understanding of the phenomenon under study.

The university students participating in the research were those that met the inclusion criteria, namely: age 18 or older, enrolled in some undergraduate course before the COVID-19 pandemic outbreak (March 2020) and attending courses during 2020. Students taking technical and graduate courses were excluded.

Considering the method, the quantitative data were first collected and analyzed, providing support to construct the collection instrument for the qualitative data, which were subsequently collected and analyzed¹⁰.

The sample for the first stage was calculated using stratified sampling, considering the number of students in each *campus*. The population of all four *campuses* was 27,757 students. After calculation and with an expected loss of approximately 20%, the sample size was 403 students, resulting in 404 interviewees. The sample for obtaining the qualitative data was for convenience, taking into account the data saturation technique, when the answer pattern began to be repeated¹¹, totaling 20 university students.

Data collection took place in two phases between March 2021 and April 2022. The quantitative data were gathered through a structured questionnaire containing questions about sociodemographic characteristics, sexual behaviors, and use of legal and illegal substances and dating apps to find sex partners.

The qualitative data were collected by a researcher with an MSc degree and attending a PhD course in Nursing and due experience in multicenter mixed-methods research, through semi-structured interviews containing five questions about dating app use. A pilot test was carried out with five students. The participants were recruited by means of telephone calls.

The interviews took place in the Zoom[®] platform, lasted a mean of 15 minutes and were recorded on a smartphone and deleted after transcription. Field notes were taken down. In order to preserve anonymity of the participants' statements in the second phase of the study, a code generated according to the order in which the interviews were conducted (I1, I2... I20) was used to present the results.

The quantitative data were processed in Jamovi[®] and RStudio[®]. Descriptive and inferential statistical analyses were performed. To investigate the factors associated with dating app use, a bivariate analysis was performed using the

Chi-square and *Fisher's* exact tests. Subsequently, in order to estimate the Odds Ratio (OR) for each variable, a binary logistic regression model was applied to the significant variables ($p\text{-value} \leq 0.05$). $OR > 1$ was considered as a risk factor and $OR < 1$ as a protective factor¹².

The qualitative data analysis was performed in the *NVivo*® software, version 14, enabling the analysis of thematic categorical content and creating a word tree for graphical representation. The material segmentation process was based on the use of context units, while coding was implemented using the topic as recording unit¹³. The graphic illustration was generated from the most frequent terms and their semantic connections in the participants' statements. Such strategies contributed to a broader understanding of the phenomenon under study and eased reporting the results, thus expanding their visualization and analysis¹⁴. The quantitative and qualitative data integration was presented in a Joint display.

The study followed all due ethical precepts, with submission of the research protocol to the Research Ethics Committee of the institution involved, which approved it. It is important to note that the study participants were invited to read the Free and Informed Consent Form (FICF) and that they had to select the "I have read the form and agree to take part in this research" option to participate.

RESULTS AND DISCUSSION

The study participants were 404 students; Table 1 presents their characteristics.

Table 1: Sociodemographic and academic characteristics, as well as those related to sexual orientation and condom use frequency associated with dating app use (n=404). Paraíba, Brazil, 2022.

Variables	Dating app use to find sex partners		p-value
	Yes (n=200) n (%)	No (n=204) n (%)	
Gender			0.000*
Female	80 (34.2)	154 (65.8)	
Male	120 (66.7)	50 (33.3)	
Living in university dorms			0.000*
Yes	77 (69.4)	34 (30.6)	
No	123 (42.0)	170 (58.0)	
Staying in university dorms during the pandemic			0.035*
Yes	75 (96.2)	03 (03.8)	
No	28 (84.8)	05 (15.2)	
Undergraduate course area			<0.001*
Humanities	22 (35.5)	40 (62.0)	
Exact Sciences	17 (54.8)	14 (45.2)	
Health	09 (11.5)	69 (88.5)	
Engineering	05 (35.7)	09 (64.3)	
Sexual orientation			0.000*
Homosexual	76 (38.0)	124 (62.0)	
Heterosexual	48 (52.7)	43 (47.3)	
Bisexual	75 (67.0)	37 (33.0)	
Asexual	01 (100.0)	0 (0.0)	
Condom use frequency in the last 12 months			0.003*
Always	74 (63.2)	43 (36.8)	
Sometimes	89 (58.2)	64 (41.8)	
Never	18 (35.3)	33 (64.7)	

Note: *Statistically significant association.

Among all 404 interviewees, there was predominance of females (n=234; 57.9%), age between 18 and 24 years old (n=91; 72%) with a mean of 24 (± 4), brown skin color (n=174; 43.1%), single individuals (n=352; 87.1%), professing some religion (n=219; 54.2%), receiving some grant from the university (n=271; 67.1%) and with no paid job (n=317; 78.5%).

It was found that most of the students were attending health courses (n=111; 27.5%) and did not live in university dorms (n=293; 72.5%). Of the 111 (27.5%) that did live in university dorms, 103 (92.8%) stayed there during the

pandemic. The participants' mean age at sexarche was 16 (± 3.74). The prevalence of dating app use to find sex partners was 49.5% (95% CI=0.445-0.545).

The study results present significant and pertinent variables for discussion about the objective proposed. Approximately half of the interviewees use dating apps to find sex partners. In this sense, research studies in the United States and in the state of Amazonas, Brazil, showed that 82.11% and 66.3% of the students used these apps, respectively^{2,3}. This fact is associated with the apps offering free versions and simplified interfaces¹⁵.

Through bivariate analyses of the variables corresponding to sociodemographic and academic characteristics, sexual orientation and condom use frequency associated with dating app use to find sex partners, it was shown that gender ($p=0.000$), living in university dorms ($p=0.000$), staying in university dorms during the pandemic ($p=0.035$), undergraduate course area ($p<0.001$), sexual orientation ($p=0.000$) and condom use frequency in the last 12 months ($p=0.003$) presented statistically significant associations.

The results corresponding to the binary logistic regression analysis for dating app use to find sex partners according to the variables researched are presented in Table 2.

Table 2: Binary logistic regression analysis for dating app use to find sex partners. Paraíba, Brazil, 2022 (n=404).

Variables	Odds Ratio (OR)	95% CI*	p-value
Gender			0.002**
Female	4.32	1.73-10.82	
Male	1		
University grant beneficiary			0.016**
Yes	1		
No	3.12	1.24-7.91	
Course area			0.052**
Health	2.96	0.99-8.90	
Others	1		

Notes: *95% CI: 95% Confidence Interval; **Statistically significant association.

Female students were 4.32 times more likely to search for partners when compared to their male counterparts (OR: 4.32; 95% CI = [1.73; 10.82]; $p=0.002$). Those who do not receive university grants are 3.12 times more likely to resort to that search when compared to those who do receive them (OR: 3.12; 95% CI = [1.24; 7.91]; $p=0.016$) and those attending health courses are 2.96 times more likely to use dating apps to find sex partners in relation to other areas (OR: 2.96; 95% CI = [0.99; 8.90]; $p=0.052$).

Regarding the association between females and app use, the search may be related to the freedom to find partners and to the possibility of establishing connections without the pressure inherent to traditional dating. In some cases, they have used their profiles to obtain financial benefits and advantages, especially young women up to 25 years of age^{16,17}.

In this study, it was discovered that most of the interviewees that used dating apps to find sex partners were health students. There is scarcity of research studies presenting the sexual behaviors of young university students in the health field in relation to using digital devices¹⁸, and further surveys with high methodological rigor are required to understand the impacts of this use on RSBs.

Regarding the association with sexual orientation, the popularity of apps among homosexuals is related to the fact that their members can connect and find quick relationships, selecting users according to their preferences through photographs and elaborate biographies. Furthermore, as they work discreetly, these tools allow people to let their sexuality flourish without oppression from society^{16,17}.

A research study conducted in all Brazilian regions reveals that homosexuals use dating apps in their daily lives¹⁹. A multicenter survey in Brazil and Portugal indicates that high dating app use levels among homosexuals are associated with a sense of comfort in finding a sex partner, whether steady or temporary, which is most often unprotected and/or associated with using legal and illegal substances²⁰.

As for consumption of legal and illegal substances, smoking tobacco/cigarettes ($p=0.000$) and using some type of illegal substance ($p=0.000$) showed statistically significant associations when related to dating app use to find sex partners.

A cross-sectional study conducted in Hong Kong found that using dating apps for more than a year is associated with recreational drug consumption along with sexual activities, showing that dating app use is an emerging risk factor for drug misuse²¹. Another study carried out in Italy states that dating app use was responsible for greater chances of consuming *Cannabis*²².

The second phase of the study involved applying semi-structured interviews with the objective of obtaining qualitative data on the topic. Through the participants' testimonies, it was possible to identify that using apps to find sex partners is a common practice in the university environment.

Twenty students (100%) took part in this stage, both female ($n=10$, 50%) and male ($n=10$, 50%), professing some religion ($n=10$, 50%) and not professing any religion ($n=10$, 50%); most of them belonged to the age group between 18 and 24 years old ($n=13$, 65%), were brown-skinned ($n=9$, 45%), single ($n=17$, 85%), with family incomes between one and two minimum wages ($n=8$, 40%) and not living in university dorms ($n=16$, 80%).

Considering the objective of this research and after analyzing the interviews in NVivo®, the following categories emerged: 1) "Aspects associated with app use"; 2) "Influence of friends and family members on dating app use"; and 3) "Influence of using legal and illegal substances on the search for partners in apps".

Category 1: Aspects associated with app use

The participants reported using dating apps for fun, meeting people, discovering themselves, forgetting frustrations from previous relationships, reducing feelings of loneliness and having sex.

I also discovered there that I could go further, it was then that they presented me an app for finding people to date. And from then on, I only thought about using it to discover more about myself. (I8, female)

I used it to relax, have fun, forget about problems, rejection, discrimination. (I9, female)

I was alone when I downloaded this app. Some friends had already told me about it, but I'd never been interested. On that day of immense loneliness and tiredness from having had so many frustrated and terrible relationships, I decided to give it a try. (I10, female)

Young people have different reasons for using dating apps; these reasons vary depending on the context in which they live. A study conducted with 862 young individuals in Australia found that the predominant motivating factors for using apps were boredom and casual sexual relationships⁶. Another study also found that the motivations for using dating apps were communication ease, self-worth validation, excitement and modernity²³.

Category 2: Influence of friends and family members on dating app use

The influence of social relations on the dating app use practice was noticed, especially among female university students.

I used it both alone and when I was in a group, young people together end up influencing each other, you know. (I8, female)

I downloaded the app because a cousin of mine recommended it to me. She said she used it, that I should download it too, that it was really good and so on. (I11, female)

Then I downloaded Tinder, influenced by my friends who kept whispering in my ear saying it was good. (I14, male)

I've used Tinder and Grindr and, when I first started using them, I had no idea where it could lead me to. I used them with three of my friends, and they were the ones who influenced me to download the apps. (I15, female)

A number of research studies show that dating app use can influence users to adopt risky sexual practices, such as having multiple partners or group and unprotected sex^{24,25}.

Regarding social influence on app use, some research studies noticed that friends and family members encourage individuals to use dating apps, as recommendations from close people promote more trust and motivate searching new experiences^{26,27}.

Category 3: Influence of using legal and illegal substances on the search for partners in apps

Regarding the influence of substance use on the search for sex partners in dating apps, the students reported that the effect promoted by these substances increases sexual desire, culminating in the search for dates in apps.

Yes, I've used these substances and they influenced the search thing... When you're drunk or high, you only think about the moment, about pleasure, so I immediately grab my cell phone and go after it. (I7, male)

When I used illicit substances, I felt encouraged to use more and felt much more eager to have sex at all times. But it only happened this first time that I used the app and met my first sex partner and he encouraged me to use it. (I10, female)

I've already used every crazy thing that exists, both legal and illegal, especially when I was on dates, because I was too influenced. Every time I used these things I wanted to go after more people to have sex with, I'd open the app and start hunting, you know. (I12, male)

When I drank, I think it made me want to have more sex. I mean, I'd go to a party and start drinking and, when that drink was already taking effect, I'd have a strong desire to use the app to find a sex partner. (I15, female)

Regarding the use of legal and illegal substances, this study presented important results: the participants stated that their consumption stimulated the search for sex partners through dating apps. Such substances have effects that cause disinhibition and increased libido. Excessive consumption is related to an increase in the practice of RSBs¹.

A research study carried out in Los Angeles with 295 participants indicates high rates for excessive consumption of alcohol (59%), marijuana (37%) and illicit substances (27%) associated with dating app use²⁸.

Figure 1 shows the Joint display with the quantitative and qualitative data integration.

App use among university students	
Quantitative Results	Qualitative Results
Association between homosexual orientation and app use (p=0.000*)	<i>I learned to use the app and then things started to get better. I did have straight sex, but the best was the gay sex, and threesomes too. It was really good; heavy, but good. (I13, male)</i>
"Sometimes" as answer to Condom use frequency associated with app use (p=0.003)	<p><i>I used condoms sometimes, but I didn't even have time others, especially when it happened in sinister places, in places where it had to be done quickly, even due to the heat of the moment, and that was what happened: either I did it without a condom or I didn't finish the game, talking about sex, right? (I7, male)</i></p> <p><i>I used to use condoms, but every now and then I wouldn't. And that's when I'd get suspicious and go straight to getting tested, you know. I know I should always use them but, at that moment, I don't know what goes through my head and I go into a trance, you know. (I14, male)</i></p> <p><i>Yes, I had sex. And most of the time I used condoms, but some others I didn't. Even though they were people I'd never had contact with, I was irresponsible and didn't use them. Lucky for me I never had anything, because I'd have caught a bomb otherwise, you know. (I16, male)</i></p>

Figure 1: Joint display with the quantitative and qualitative data integration. Paraíba, Brazil, 2022.

A worrying but not uncommon factor is neglecting condom use in sexual relations with partners found through dating apps. It is worth noting that adherence to condom use is related to socioeconomic, cultural and religious aspects, as well as to knowledge about the subject matter²⁷.

In this context, the students believe that condoms reduce pleasure and sensitivity and favor a "break in the mood" during intercourse, which explains low adherence to this barrier method²⁹. Furthermore, when legal and illegal substances are used, unprotected sex practices are more likely³⁰.

Figure 2 presents the tree for the word most used in the testimonies ("app"), revealing the different nuances associated with the context in which they are used.

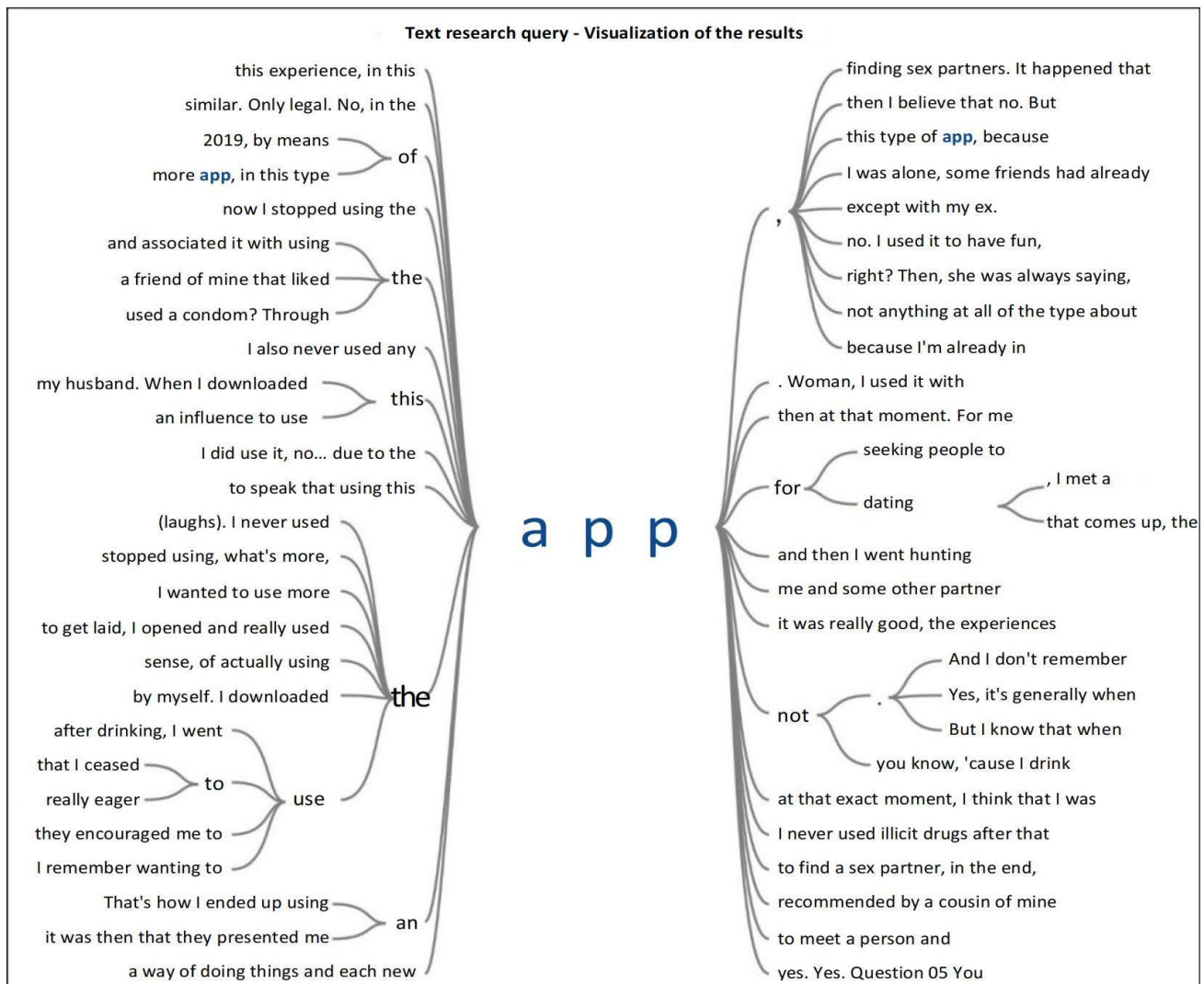


Figure 2: Word tree. Paraíba, Brazil, 2022.

It can be noticed that the main connections are related to the influence of friends on app use, to resorting to apps for relaxation, to the search for sexual relations and to consumption of legal and illegal substances during the process.

It is relevant to note that the analytical phase of this study was important to determine associations between several variables and dating app use to find sex partners. However, it is pertinent to highlight the importance of the students' testimonies to understand the factors associated with app use.

Study limitations

Regarding the study limitations, it is worth noting that the setting under study only consisted of participants from a single Brazilian state. In addition, the scarcity of research studies on the subject matter aimed at university students hindered data discussion. However, despite such limitations, the current study complements the knowledge available in the literature on the topic and offers contributions to Public Health, considering that dating app use by young people is a current and growing reality, especially after the COVID-19 pandemic.

CONCLUSION

This study provided data on dating app use by university students in the COVID-19 pandemic context. The "gender", "living in university dorms", "staying in university dorms during the pandemic", "undergraduate course area", "sexual orientation", "condom use frequency in the last 12 months", "smoking tobacco/cigarettes" and "frequency

using some type of illicit substance” showed significant associations with dating apps use. Female students, as well as those not living in university dorms and those attending health area courses, are more likely to use such apps.

The qualitative data reveal that the university students sought dating apps for distraction, to meet people and to find sex partners, oftentimes under the influence of friends and family members. Through the participants' statements, it can be inferred that there is low adherence to condom use in sexual relations with partners found through apps, as well as the influence of using legal and illegal substances on the search for partners.

It is important to highlight that, after finishing the study, the researchers presented the results to the academic community and managers of the university *campuses* involved. The findings highlight the need to develop new studies and public policies aimed at young university students, in addition to the relevance of implementing reproductive and sexual health education actions in universities, as well as high-impact apps for the young population.

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Use of artificial intelligence tools

Authors declare that no artificial intelligence tools were used in the composition of the manuscript "Dating app use among university students: A mixed-methods study".