Nomophobia and its repercussions on the occupations of university students

Nomofobia e suas repercussões nas ocupações dos estudantes universitários

La nomofobia y sus repercusiones en las ocupaciones de los estudiantes universitarios

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Objective: to investigate the existence of nomophobia among university students and its occupational repercussions. **Methods:** quantitative-qualitative research, with a descriptive approach, carried out with academics from a Brazilian federal public university between the years 2022 and 2023. Data were collected through the Nomophobia Questionnaire validated version for Brazilian Portuguese of the application, after the experience taken from smartphones during the period of one school shift. Content analysis and descriptive analysis were used. **Results:** 68 university students participated, with an average age of 22 years, of which 54 identified as women. The students scored above 20 points, highlighting 50% moderate and 23.5% in degree of Nomophobia. Three thematic categories were constructed: *Reactions to moving away from smartphone related occupations*; *Occupations, forgetfulness and searching for the device*; and *Peace of mind by being involved in another activity*. **Conclusion:** the unrestricted and unrestrained use of smartphones can lead to losses in the performance of other occupations such as academic activities, leisure, social participation and rest and sleep of these students, and can evolve into conditions that compromise health and well-being as is the case of nomophobia.
Descriptors: Internet addiction disorder; Occupations; Student health.

Objetivo: investigar a existência da nomofobia entre universitários e suas repercussões ocupacionais. **Método**: pesquisa quanti-qualitativa, de abordagem descritiva, realizada com acadêmicos de uma universidade pública federal entre os anos de 2022 e 2023. Os dados foram coletados através do *Nomophobia Questionnaire* versão validada para português brasileira da aplicação, após a experiência retirada dos smartphones durante o período de um turno de aula. Utilizou-se análise de conteúdo e análise descritiva. **Resultados**: participaram 68 universitários, com idade média de 22 anos, dos quais 54 se identificavam como mulheres. Os universitários pontuaram acima de 20 pontos, com destaque para 50% moderado e 23,5% em grau de Nomofobia. Três categorias temáticas foram construídas: *Reações frente ao afastamento das ocupações relacionadas ao Smartphone; As ocupações, o esquecimento e a busca pelo aparelho;* e *a Tranquilidade por estar envolvido em outra atividade*. **Conclusão**: o uso irrestrito e desenfreado dos *smartphones* pode acarretar prejuízos na realização de outras ocupações, como atividades acadêmicas, lazer, participação social e descanso e sono destes estudantes, podendo evoluir para quadros que comprometem a saúde e bem-estar, como é o caso da nomofobia.
Descritores: Transtorno de adição à internet; Ocupações; Saúde do estudante.

Objetivo: investigar la existencia de nomofobia entre universitarios y sus repercusiones ocupacionales. **Método:** estudio cuantitativo-cualitativo con abordaje descriptivo, realizado con estudiantes de una universidad pública federal entre 2022 y 2023. Los datos se recogieron mediante el *Nomophobia Questionnaire*, versión validada para el portugués brasileño, tras la experiencia de retirar los smartphones durante un turno de clase. Se utilizó análisis de contenido y análisis descriptivo. **Resultados:** Participaron 68 universitarios, con edad media de 22 años, de los cuales 54 se identificaron como mujeres. Los universitarios puntuaron por encima de 20 puntos, con un 50% de nomofobia moderada y un 23,5% de nomofobia. Se construyeron tres categorías temáticas: *Reacciones al alejamiento de las ocupaciones relacionadas con los smartphones; Ocupaciones, olvido y búsqueda del dispositivo; y Tranquilidad por estar involucrado en otra actividad.* **Conclusión:** El uso ilimitado y desenfrenado de los smartphones puede tener un efecto perjudicial en el desempeño de otras ocupaciones, como las actividades académicas, el ocio, la participación social y el descanso y el sueño, y puede derivar en condiciones que comprometan la salud y el bienestar, como la nomofobia.
Descriptores: Trastorno de adicción a internet; Ocupaciones; Salud del estudiante.

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INTRODUCTION

The age range of university students is between 18 and 29 years old, which is also the age range with the highest rates of mobile phone use[1]. In this sense, the use of smartphones during academic activities has become increasingly frequent and, although the device has positive contributions, the multitasking characteristic of the device makes it more attractive to students, which may harm their academic performance[2].

Historically, it is known that, with the advent of capitalism, industry proposals emerged to invest more and more in machines and objects whose main characteristic was practicality. Furthermore, the internet has become the main tool in the search for learning and leisure, given that it offers ease and speed of access to information, the possibility of being in synchronous contact with distant people, access to social media networks, among other benefits[3].

It is considered, then, that the new generations have more affinity with these resources and that this group is also more likely to develop some type of dependence, as they easily accept the mobile phone as a status symbol or use the smartphone as a defense mechanism in unpleasant environments or situations[4].

Within this scenario, there is a need to understand the impacts on the lives of individuals who use these technological resources in an unrestrained way. In England, the term Nomophobia appears, which is based on the expression "no mobile phone phobia", which causes the subject feelings of anguish, discomfort, disproportionate fear and nervousness when not in direct contact with the smartphone or inability to access the internet, causing significant interference in their routine and way of living[5].

Such impacts have already been studied and showed that Nomophobia, as a disorder of modern society, should be included in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), since it has characteristics of an anxiety disorder, in which a specific stimulus, such as being disconnected from the smartphone or internet, leads to an irrational and disproportionate response to the stimulus such as fear, anguish and anxiety symptoms[6]. Furthermore, it is understood that the time away from the mobile phone tends to extend thoughts, feelings and physiological responses in relation to threatening impulses, thus, the absence of the mobile phone linked to time leads to apprehensive thoughts of not being in contact with the device[7].

In this scenario, it is noted that Nomophobia has a direct interface with issues related to social participation, quality of life, rest and sleep and the occupations that human beings undertake during the day, including young people and their academic activities. and, for this

reason, there is a need to investigate and understand the daily occupations of university students who use mobile phones and the internet, especially during their learning process.

For the American Occupational Therapy Association (AOTA)[8], occupations would be the daily activities that the individual engages in, they always take place within a context and are directly influenced by client factors, performance skills and performance standards.

Furthermore, AOTA classifies these occupations into small groups, namely, ADLs (activities of daily living), IADLs (instrumental activities of daily living), health management, rest and sleep, education, work, fun, leisure, social activities and participation, these combined activities bring several gains to individuals, providing a better and more functional lifestyle. However, when there is an imbalance, the effects of occupation can become negative and cause some significant losses to individuals. In this sense, it is believed that it is important to have a balance between the person, their occupations and the environment in which they are inserted.

In addition, the use of a mobile phone connected to the internet is one of the most significant and highly involved occupations of adolescents, however, the exaggerated and constant use of the device ends up being an occupation that is harmful to their health[9].

The occupation of "using the mobile phone" is classified as the main form of leisure and it was noted that this occupation is carried out concomitantly with others, such as eating, going to school, sleeping and even interacting with friends, which causes an imbalance between these occupations, even preventing others from being carried out, such as practicing physical exercise, eating well and getting a full night's sleep. Therefore, the present study aims to investigate the existence of nomophobia among university students and their families. occupational repercussions.

METHODS

This is a quantitative-qualitative research, with a descriptive approach, which was carried out at a Brazilian federal university, between the months of September 2022 and April 2023.

Students from undergraduate Physical Therapy and Occupational Therapy courses, selected for convenience, participated in the research. All those who were over 18 years old, were regularly enrolled and had a smartphone were included in the study. All those who chose to abandon the research, had any difficulty in responding to the research protocols or who do not use smartphones or the internet were excluded from the study.

Data were collected through the application of research protocols after an experience of being without smartphones for the period of an entire school shift, that is, those who agreed to

participate in the research handed over their smartphones, which were only returned at the end of that shift. Mobile phones were left on the classroom table under the responsibility of the teacher in charge.

Initially, a semi-structured interview was carried out, based on the occupational profile, with a view to identifying how the participants used the smartphone and also understanding what they felt when they were unable to use it. The questions were as follows: *Describe to me what your day is like using your smartphone? "How much time do you spend every day using your smartphone and what do you usually do?"; "Why do you use it or what else drives you to use your smartphone?", "What do you feel/felt when you don't use your smartphone?"* and also, "*Is there anything curious/unusual that happened to you while you were not using your smartphone?*"

The analysis of this data occurred through content analysis, and the data was collected by voice recording, faithfully transcribing the statements for analysis, following the three basic steps established by Bardin, the organization of the data; coding, creating registration and context units; and finally, categorization, grouping the data into similar categories of analysis[10]. All transcripts were validated by a second researcher, acting as a jury and the names used are fictitious, chosen at random by the researchers.

Subsequently, the Nomophobia Questionnaire (NMP-Q) was applied to the Portuguese language (NMP-Q-BR), which, after undergoing tests and translations, validation and adaptation was established based on semantic, idiomatic, cultural and conceptual parity[11].

The NMP-Q has 20 items to be answered that address four dimensions of nomophobia, namely: not being able to communicate, losing connection, not being able to access information and giving up convenience. Furthermore, all items are graded by intensity from 1 to 7, with 1 being strongly disagree and 7 being strongly agree, and the sum of points classified as: 0 - 20 points, no nomophobia; 21 - 59 points, mild nomophobia; 60 - 100 points, moderate nomophobia and above 100 points, severe nomophobia[11]. Furthermore, the questionnaire has no upper age limit, is accessible and easy to apply, given that it was completed by the participant themself.

To carry out the analysis of this data, a database, tables and graphs were created using Microsoft Excel 2016™, performing a statistical balance, in which, based on the research variables, a descriptive analysis was carried out, in addition to presenting the values percentages of each categorical variable.

Each dimension was analyzed separately, dividing the topics to be analyzed individually and each topic received a score from 1 to 7, to verify which of them university students had greater or lesser discomfort, thus carrying out a more detailed and focused analysis of the

dimensions presented. Although the questionnaire presents 4 dimensions, the present study focuses on only two of these areas, namely loss of connection and giving up convenience.

This analysis was carried out in such a way that the frequency of responses for scores 1, 2 and 3 were grouped and informed the percentage of people who disagreed in some way with the statements; Score 4 was analyzed in isolation, reporting the percentage of people who neither completely disagree nor fully agree. And then, scores 5, 6 and 7 were grouped and their results demonstrated the percentage of students who fully agree in some way with the statement presented.

This study was approved by opinion 5,576,461 of the Research Ethics Committee (CEP) involving human beings.

RESULTS

Characteristics of participants

68 university students were interviewed, with a minimum age of 18 and a maximum of 48 years, with an average of approximately 22 years, and of these, 14 students recognized themselves as men and 54 identified themselves as women.

Quantitative results
Degree of Nomophobia in university students

Initially, data regarding the scores obtained in the NMP-QBR were presented. From the 68 responses, all participants scored above 20 points, that is, they present some degree of Nomophobia, in which 18 participants scored in the range of 21 to 59 points, resulting in mild Nomophobia, 34 of the interviewees, that is, the majority of participants, scored between 60 and 100, marking a moderate Nomophobia and, 16 interviewees obtained a score greater than 100, demonstrating a severe case of Nomophobia, as shown in Table 1.

Table 1. Nomophobia data, Belém/PA, Brazil, 2023.

Level of Nomophobia	Number of people (%)
None (0-20 points)	0 (0.0%)
Mild (21-59 points)	18 (26.5%)
Moderate(60-100 points)	34 (50.0%)
Severe (> 100 points)	16 (23.5%)

Giving up convenience

Moving on to the first dimension analyzed, giving up convenience, which consists of not using the mobile phone due to some circumstance saúde not by one's own decision, as is the case of running out of battery, running out of data and internet limits or getting stuck somewhere and unable to use the smartphone.

In the first item of this section, 53.0% of students scored between 5 and 7, showing that they agree with the alternative and are tormented when their phone runs out of battery. Despite saying they worry if the battery runs out, in the second item on the list, 66.2% of students say they will not panic if their credits run out or if their data limit is reached. However, when asked, in the last topic of this dimension, about the fear of being stuck and not being able to pick up the mobile phone and use its functions, the majority, 51.5%, of the students, agreed in some way with the information, stating that they felt such fear. As can be seen in Chart 1.

Chart 1. Dimension of nomophobia - withdrawal for convenience, Belém/PA, Brazil, 2023.

1. Running out of battery would torment me	
1, 2, 3 (Strongly disagree)	36.9%
4	10.3%
5, 6, 7 (Strongly agree)	53.0%
2. If I ran out of credit or reached my data limit, I would panic	
1, 2, 3 (Strongly disagree)	66.02%
4	7.2%
5, 6, 7 (Strongly agree)	26.6%
3. If I could not use my smartphone, I would be afraid of getting stuck somewhere	
1, 2, 3 (Strongly disagree)	42.6%
4	5.9%
5, 6, 7 (Strongly agree)	51.5%

Loss of connection

The other dimension analyzed concerns the loss of internet connection through smartphones. The 1st item deals with constantly checking the data signal or trying to connect to a wi-fi network if you do not have a stable internet signal. 50.0% of students who responded to the questionnaire agreed that they regularly checked and tried to reestablish their connection when it was interrupted.

Despite this constant search for an internet connection, the results of the 2nd item in this dimension demonstrate that those surveyed are not nervous because they would be disconnected from an "online" identity, given that around 73.5% disagreed with this statement. Furthermore, in the 3rd item of the section, 54.4% of respondents stated that they also did not feel uncomfortable when they were unable to keep up to date with social media and online connections when away from their smartphone.

In the Nomophobia Questionnaire, the 4th item of the dimension indicated that 42.7% of respondents would feel strange if they were not be able to check update notifications from their contacts and their online connections, if they did not have their mobile phone on hand. On the other hand, 42.6% of those interviewed disagreed in some way with the statement and only 14.7% of people neither agreed nor significantly disagreed with the statement.

The 5th item reports on the anxiety felt when they do not have their mobile phone in hand and are unable to check their emails, the results indicate that the vast majority, that is, 79.4% of university students interviewed disagree with the which is presented in the item and did not feel anxious about checking email frequently.

In the 6th and last item of the dimension, there is the following sentence: "I would feel strange because I wouldn't know what to do", and when asked about this, 58.7% of interviewees disagreed that if would feel strange in this situation. Data regarding this dimension can be viewed in more detail in Chart 2.

Qualitative results

In relation to qualitative data, the reports with the highest incidence brought to light anxiety, forgetting that they had handed over their mobile phone for research and, in a less incident but still expressive way, a feeling of tranquility or of not missing the moible phone because they were engaged in other meaningful activities. Three thematic categories were constructed: 1) *Reactions to moving away from smarthphone related occupations*; 2) *Occupations, forgetfulness and searching for the device*; and 3) *Peace of mind by being involved in another activity.*

Reactions to moving away from smarthphone related occupations

This category concerns the sensation and symptoms of anxiety mentioned by university students when they are away from their mobile phones, with a different sensation, given that they are used to always having their smartphone nearby, using its functions or just having the mobile phone in hands, as Antônio points out in his report:

[..], *I was a bit anxious... I don't know, strange, it gave me a bit of anxiety, because normally I always have my phone there, I might not be using it, but I don't know, I want to hold it,* [..]. (Antônio, 22 years old)

A recurring point, as Cleo points out, is the need to have the mobile phone with them as it is the only viable option to occupy themself, despite there being other options, smartphones are always the first search, due to their practicality and functionality, especially when it comes to facilitated communication:

I was anxious, because as I told you, it seems like I need to have something to do. The moment I don't have anything to do, I start to get anxious. "What am I going to do" "what am I not going to do?". Of course, opportunities arose, "ah, I'm going to finish my project", but I'm like "ah, I have to watch this thing on my mobile phone", "tell someone this", "tell someone else that". Because if I leave it for another time I won't do it. So I think I was a little anxious. (Cleo, 21 years old)

Chart 2. Dimension of Nomophobia - Loss of Connection, Belém/PA, Brazil, 2023.

1. If I did not have a data signal or could not connect to wi-fi, I would constantly check to see if I had signal or could find a wi-fi network	
1, 2, 3 (Strongly agree)	38.2%
4	11.8%
5, 6, 7 (Strongly disagree)	50.0%
2. I would get nervous to be disconnected from my online identity	
1, 2, 3 (Strongly agree)	73.5%
4	14.7%
5, 6, 7 (Strongly disagree)	11.8%
3. I would feel uncomfortable if I was not able to keep up with social media and online connections	
1, 2, 3 (Strongly agree)	54.4%
4	13.2%
5, 6, 7 (Strongly disagree)	32.4%
4. I would feel strange if I was not able to check my contacts' and online connections' update notifications	
1, 2, 3 (Strongly agree)	42.6%
4	14.7%
5, 6, 7 (Strongly disagree)	42.7%
5. I would feel anxious if I was not able to check my emails	
1, 2, 3 (Strongly agree)	79.4%
4	4.4%
5, 6, 7 (Strongly disagree)	16.2%
6. I would fee strange because I would not know what to do	
1, 2, 3 (Strongly agree)	58.7%
4	7.4%
5, 6, 7 (Strongly disagree)	33.9%

Added to this, when away from their smartphones, students reported that they felt anxious because they had the feeling of losing some communication with their peers or not receiving some important information due to the fact that they were unable to maintain a stable connection, a fact exemplified in the speech of Sueli:

I use it because I like to stay connected with my friends, to receive information, so I get a little anxious if I feel like I'm not receiving any information when I'm not connected to the internet. (Sueli, 22 years old)

Occupations, forgetfulness and searching for the device

Other reports bring up the issue of constant searching for the device, linked to forgetting that they had handed over the mobile phone for research:

[...] *I would forget, then I would usually want to get it* [the mobile phone] *and I couldn't find it, then I would remember.* (Catarina, 23 years old)

Because there was a time when I forgot that I didn't have my mobile phone, I even asked: "Where's my phone?", then I said "Oh yeah, it's there on the table", I had forgotten that fact. (Paola, 21 years old)

Peace of mind by being involved in another activity

Some students reported that they did not feel a difference in whether or not they had their smartphones with them during the learning activity, given that they were involved in another significant activity that required their attention:

Honestly, I didn't feel much of a difference, I felt it because I was busy on class, that sort of thing. But maybe, if I had it at home it would be a different situation. But as I was busy, I was attending classes, so I didn't feel that much of a difference, I wasn't in all that agony, I'm still not that much. (Maxi, 18 years old)

At first I felt very uncomfortable without my phone, but as the afternoon went on I started to feel more at ease realizing that I didn't need to have it with me at that moment, [...], it was something I know that If I had it with me I would have used it but as I wasn't there it was very calm, so much so that when I finished my activity I even took a walk around the college, ate a chocolate cake, maybe I would have been happier because That's it, but I think I managed to spend this afternoon peacefully. (Paloma, 19 years old)

DISCUSSION

University students identified the use of smartphones as one of the fundamental occupations for the construction of their daily routines, assuming an occupational form that can influence their well-being[9], considering that the time used for smartphones is being an influencing factor for the development of disorders, such as nomophobia, which was identified in all students who participated in the study.

Furthermore, it is noted that there are different sensations when they are taken away from their smartphones, corroborating the concept that the meaning given to each occupation carried out is individual and differs from one person to another[12]. Thus, being away from the mobile phone during class caused opposite sensations, while for some it was distressing, for others it generated tranquility through the opportunity to engage in other occupations.

From this perspective, an excessive fear of not having access to a mobile phone, computer and/or the Internet in their learning process, generated excessive nervousness, anxiety or insecurity, which directly impacts the execution of their academic activities[13], in which they stated that if they no battery, it would torment them in some way, thus causing negative sensations, given that the verb torment means to cause a feeling of distress or torment[14].

In some reports, it is possible to see that there is an imminent need to be busy with something at all times, which may be a characteristic of the immediate society, in which leisure

is devalued and the multiple execution of tasks is overvalued, which can generate anxiety, given that the busier they are, the higher their productivity, increasing the feeling that things must be resolved immediately.

In this scenario, smartphones have become the mainstay because they are easy to access, allow for practicality and the possibility of engaging in several occupations at the same time. There is recognized functionality that these devices have in people's lives and how this tool can solve everyday difficulties and situations, as they said they felt afraid of being stuck somewhere when it was not possible to use their mobile phone.

Due to the excessive use of these technologies, when there is a lack of access to information or devices during daily life, the so-called information anxiety[15] arises, which exposes the need for people to always be well informed, updated, and in contact with their family and friends. Currently, smartphones make it possible for this need to be met quickly, so being unable to use it is a determining factor in the increase in this feeling of anxiety.

The students responded that they did not agree with the statement about feeling uncomfortable about not keeping up to date with online media and connections when they do not have their mobile phones with them. However, others pointed out that they felt strange not being able to check their notifications and updates from media and online connections.

The lack of smartphones is not just about maintaining a connection or exchanging information via the internet, it is related to the possibility of being able to use smartphones and their functions whenever they want, as the need is related to the comfort of having mobile phones in hand with a battery and able to carry out the activities related to it, regardless of the existence of an internet connection, as revealed by some that they would suffer if they ran out of battery on their mobile phone, however, others stated that they would not panic if their credits ran out and/or if they reached their internet data limit.

The ease that smartphones provide in accessing information and communication means there is a need to have control over this information, which makes it comfortable to always be on top of everything without having to make a lot of physical and/or mental efforts, as with mobile phones the information simply reaches its destination, whether or not it is sought after by individuals, therefore, when these university students are removed from their comfort zone, they tend to have greater feelings of anxiety and discomfort, precisely because of this relationship of dependence on smartphones.

The absence of smartphones and their other functions can cause discomfort in some individuals that manifest themselves through behavioral symptoms and mood changes, and it

is common in these situations for the individual to experience anguish, nervousness, fear, panic, among other symptoms that are attributed to the not immediately using the mobile phone[16].

The frequent desire they feel to check their smartphones, especially in relation to checking the connection, indicates that when do not have an internet connection, they constantly check if they can find a wi-fi network. However, even though there is this need to use the smartphone's internet network, 73.5% of those interviewed stated that they did not feel nervous if they were disconnected from their online identity whennot in contact with their mobile phones, that is, they would still recognize themselves beyond these instant connections that can be made in the virtual world.

Forgetting that they had handed over their mobile phone for research, some because they were involved in occupations related to academia, remembered that they were without the device only when they were looking for the smartphone to use its functions to carry out other activities. It is possible that there is a close link between these memory failures experienced by young people and the excess of information resulting from this unrestrained use of smartphones, given that they can reduce concentration and focus levels, impairing the memorization of information[16].

On the other hand, 58.7% of students disagree that they would not know what to do when they are removed from their smartphones. The opportunity for other occupations in addition to using the smartphone as a means of performing a task, can result in a reduction in the need to check the phone all the time, thus generating greater peace of mind and enriching the occupational repertoire, with other occupations that provide satisfaction and well-being, such as walking around campus, talking to other people and having a snack.

The occupation "using the smartphone" is recurrent in the routines of university students and, when they are prevented from doing so, they experience discomfort. It is noted that this use can cause harm to other occupations such as leisure, social participation, educational occupations, in addition to rest and sleep[17]. Thus, the rampant use of mobile phones and the possible dependence that these university students have on their mobile phones can be classified as an occupational imbalance, which is when a person spends too much time on one occupation to the detriment of other ways of occupying themselves[18].

From this, Occupational Scientists understand that individuals must be autonomous in choosing how they wish to engage in meaningful occupations, without interference from external factors, explained by the concept of Occupational Justice, when these requirements are not met, individuals find themselves involved in Occupational Injustice[19], sometimes when they report that if they were in another environment, their home, not using their smartphone could

cause other sensations, that is, when the environment changes, the possibilities of occupying themselves also accompany this change.

In other words, students were able to identifý other ways of engaging in occupations beyond mobile phone devices, the effects of this anxiety when moving away from their devices diminish or do not appear.

CONCLUSION

Given the above considerations, the study is of great relevance as it is a current topic that is still little explored in the scientific field, especially at a national level. This analysis brings contributions about the factors that comprise the rampant use of smartphones and their repercussions on the occupations of university students. As a result, the use of smartphones is currently understood as an occupation that is significant and recurrent in the routines of the students who participated in the research.

The unrestricted and unrestrained use of this technology can lead to losses in the performance of other occupations such as academic activities, leisure, social participation and sleep rest for these students, which can evolve into situations that compromise health and well-being, as is the case here. of nomophobia.

Limitations include: the reduced sample size in relation to the people enrolled in the periods, the non-parity in relation to gender, in addition to the barriers faced with few theoretical references to support the study.

Therefore, further research on nomophobia and its effects is suggested, aiming to produce scientific knowledge that helps reduce the impacts on health and well-being. The correlation with Occupational Therapy supports the understanding and repercussions of nomophobia in relation to the occupations carried out by students in their routines inside and outside the university environment.

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CONTRIBUTIONS
Ana Carolina Rodrigues Barra and **Bárbara Caroline Mendes Henrique** contributed to the design, collection and analysis of data, writing and revision. **Jeice Sobrinho Cardoso**, **Katia Maki Omura** and **Victor Augusto Cavaleiro Corrêa** participated in the revision.

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