**STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES****ESTUDO DAS MUDANÇAS NO COMPORTAMENTO SEXUAL EM CASAIS PERANTE AS  
TECNOLOGIAS DIGITAIS****ESTUDIO DE LOS CAMBIOS EN EL COMPORTAMIENTO SEXUAL EN PAREJAS FRENTE A LAS  
TECNOLOGÍAS DIGITALES**Isabela Melca<sup>1</sup>, Rachel de Moraes Ferreira<sup>2</sup>, Antonio Egidio Nardi<sup>1</sup>, Anna Lucia Spear King<sup>1</sup>

e3146

<https://doi.org/10.47820/jht.v3i1.46>

RECEIVED: 11/07/2023

APPROVED: 12/16/2023

PUBLISHED: 01/02/2024

**ABSTRACT**

Digital technologies are popular means of exchanging, communicating, and accessing information, and their use has been increasing in recent years. Studies of changes in society's behavior are observed because of the new way of communicating and relating. To evaluate the sexual behavior of couples during the period of social isolation imposed by the pandemic and the frequent use of Digital Technologies (DTs), an online cross-sectional survey was carried out to obtain information on sexual behavior and the use of TDs. A total of 1,357 individuals were interviewed using the Google Forms tool, of which 616 were eligible to participate in the survey. According to the data obtained, DTs were used by 24.02% of the study participants, and a change in sexual behavior was observed in this group that has the habit of using DTs. The logistic regression analysis verified an association between the variables that predicted significant and positive changes in the sexual behavior of individuals, which points to a tendency towards change in sexual behavior given the greater use of DTs.

**KEYWORDS:** Digital technologies. Social isolation. Sexual behavior. Mental disorder. Psychiatric symptoms.

**RESUMO**

As tecnologias digitais são meios populares de troca, comunicação e acesso à informação e seu uso vem aumentando nos últimos anos. Observam-se estudos de mudanças no comportamento da sociedade por conta da nova forma de se comunicar e de se relacionar. Para avaliar o comportamento sexual dos casais durante o período de isolamento social imposto pela pandemia e o uso frequente de Tecnologias Digitais (TD), foi realizada uma pesquisa transversal online para obter informações sobre o comportamento sexual e o uso de TD. Foram entrevistados 1.357 indivíduos por meio da ferramenta Google Forms, dos quais 616 foram elegíveis para participar da pesquisa. De acordo com os dados obtidos, as TD foram utilizadas por 24,02% dos participantes, sendo observada mudança no comportamento sexual nesse grupo que usou a TD. A análise de regressão logística verificou associação entre as variáveis que previram mudanças significativas e positivas no comportamento sexual dos indivíduos, o que aponta para uma tendência de mudança no comportamento sexual dada a maior utilização de TD.

**PALAVRAS-CHAVE:** Tecnologias digitais. Isolamento social. Comportamento sexual. Transtorno mental. Sintomas psiquiátricos.

**RESUMEN**

Las tecnologías digitales son medios populares de intercambio, comunicación y acceso a la información, y su uso ha ido en aumento en los últimos años. Se observan estudios de cambios en el comportamiento de la sociedad debido a la nueva forma de comunicarse y relacionarse. Para evaluar el comportamiento sexual de las parejas durante el período de aislamiento social impuesto por la

---

<sup>1</sup> Universidade Federal do Rio de Janeiro - UFRJ.

<sup>2</sup> Fundação Oswaldo Cruz - Fiocruz.



pandemia y el uso frecuente de las Tecnologías Digitales (TD), se realizó una encuesta transversal en línea para obtener información sobre el comportamiento sexual y el uso de la TD. Un total de 1.357 personas fueron entrevistadas utilizando Google Forms, de las cuales 616 eran elegibles para participar en la encuesta. De acuerdo con los datos obtenidos, el 24,02% de los participantes utilizaron la DT y se observó un cambio en el comportamiento sexual en este grupo que utilizó la DT. El análisis de regresión logística encontró una asociación entre las variables que predijeron cambios significativos y positivos en el comportamiento sexual de los individuos, lo que apunta a una tendencia de cambio en el comportamiento sexual dado el mayor uso de DT.

**PALABRAS CLAVE:** Tecnologías digitales. Aislamiento social. Conducta sexual. Trastorno mental. Síntomas psiquiátricos.

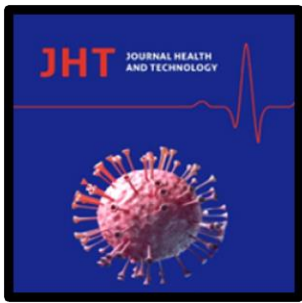
## INTRODUCTION

Digital Technologies (DTs) are popular means of exchange, communication, and access to information (Moreno-Guerrero *et al.* 2020). Through the use of digital devices, Internet, and social media the human behavior have changed (Gonçalves *et al.* 2020). The use of social networks allows immediate communications and facilitates research. Voice messages, videos or images enables new contacts and virtual meetings that relationships and face-to-face meetings (Guedes *et al.* 2016) may replace.

Mutual interaction is essential for social living between humans (Brandt *et al.* 2022). Prosocial behavior shows protective effects on physical and mental health. Social exclusion can affect personal well-being. Therefore, social isolation is a factor of distress and has been associated with mental disorders such as mood disorders, psychosis, and chemical, emotional, and technological dependence (Wijaya *et al.* 2022; Brandt *et al.* 2022; Bzdok; Dunbar 2022).

Technological dependence causes serious public health problems, such as impairment in an individual's daily activities (Cárdenas Garza *et al.* 2022). The excess of connectivity and information has been linked to several mental disorders, mainly stress, anxiety, and depression (White 2023). In addition, this excess worsens feelings of fear, insecurity, and loneliness (Gonçalves *et al.* 2020). Studies between technological addiction and psychiatric comorbidities are bidirectional, also showing that technology dependents are more likely to suffer from anxiety and depression and vice versa (Cai *et al.* 2021).

For the last three years, humans were under global stress. An infection caused by the novel coronavirus (SARS-CoV-2) began in 2019 and a few months later was declared a pandemic by the World Health Organization (WHO) (Melca *et al.* 2021; Cai *et al.* 2021). In avoidance the transmission of COVID-19, some restrictive "social distancing" measures have been adopted (Gonçalves *et al.* 2020), and people had to stay at home. Then, the risk of new contaminations and the consequences lead to social reclusion. After this time of reclusion, in May 2023, WHO downgrades the COVID pandemic and affirms that the disease is no longer an emergency (CDC 2023).



# JOURNAL HEALTH AND TECHNOLOGY - JHT

## ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

During the restrictive measures, people had to spend more time together. In this period, WHO has also recommended practicing sexual abstinence, so monogamous relationships have been suggested. Extramarital sex has been contraindicated because apart from the direct and respiratory transmission, other ways of spreading the virus are oral-fecal and sexual. Individuals that used to practice friendly, polyamorous, or casual sex had to change these patterns (Cipriano *et al.* 2020; Döring 2020; Lopes *et al.* 2020).

However, some individuals' libido has not entered lockdown mode. In this context, sexual relations need to be rethought, and DTs appear to be a coping strategy (Lopes *et al.* 2020). DTs are electronic tools, systems, devices, and data resources. Examples feature social media, online games, and cellphones. The use of digital devices fosters new forms of sexual interaction and relations. With social media like Facebook, dating apps, and sites such as Pornhub, these combinations have fostered the development of new sexual behaviors (Sfoggia; Kowacs 2014; Courtice; Shaughnessy 2017). This survey aimed to evaluate the sexual behavior of couples during the pandemic and the use of DTs.

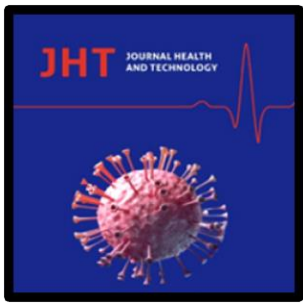
### METHODOLOGY

The study used an online cross-sectional survey with the *Google Forms* platform as the principal evaluation method. *Google Forms* is a free, cloud-based tool used to design and develop web-based questionnaires that collect data from individuals through personalized quizzes and surveys (Vasantha Raju; Harinarayana 2016; Gavin 2019). This survey is scientifically important because it gathers unbiased data from a representative sample of respondents. From 7th to 21st July 2020, 1.357 individuals answered this survey after receiving links via e-mail, WhatsApp, or Facebook messages. Reminders were sent via messaging software, and the invitation letter started with the current survey's title. All data were collected over the Internet. There were no missing data because all questions were mandatory, so incomplete questionnaires could not be submitted.

Inclusion criteria: age 19 to 70 years, residents Rio de Janeiro, Brazil, and individuals that were married or living with a partner regardless of marital status (in stable unions or living together romantically). Exclusion criteria: single marital status, defined for the study's purpose as unmarried, divorced, separated, or widowed, age under 19 years, or failure to provide informed consent.

WhatsApp: Participants were randomly selected via WhatsApp in family and friend groups, and the link was replicated in other groups. The survey was sent randomly. The survey's title in the message was "Use of Technologies and Sexual Behavior in Social Distancing," and the link was sent to participants.

Facebook: Participants were recruited through a Facebook advertisement from July 9 to July 16, 2020. According to the platform guidelines, the advertisement included a headline, main text, and a suitably sized image. The advertisement appeared in Facebook user's news feeds because it was



# JOURNAL HEALTH AND TECHNOLOGY - JHT

## ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

considered the best place to recruit survey participants (Ramo *et al.* 2014). Through the advertisement, the individual was guided to the survey's link.

Measures: Participants provided the following sociodemographic data: age, marital status, educational attainment, sexual orientation, and identity according to the options available in the questionnaire. The objective was to evaluate the use of DTs in people's sexual behavior during the isolation caused by the pandemic. The questionnaire also collected data on social isolation and changes in sexual behavior, use of dating apps, consumption of pornography, preferences for reaching orgasm, and difficulties in having a real offline relationship. Others collected information involved presence of any psychiatric disorder, use of digital resources for sexual interaction, reasons for using dating apps, and use of DTs for sexual satisfaction to prevent or interrupt COVID-19.

This survey was developed using ethical principles and was approved by the Research Ethics Committee of the Institute of Psychiatry of the Federal University of Rio de Janeiro (CAAE: 29048920.1.0000.5263). The authors agreed that this study would follow the Helsinki Declaration in 1975, as revised in 2008. All 1.357 participants provided informed consent before answering the questionnaire. Participation was entirely voluntary and anonymous; no material incentives were given.

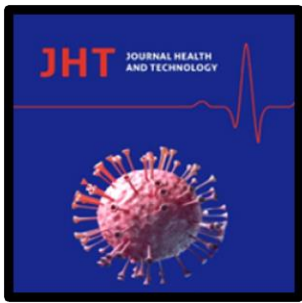
Statistical analysis was performed with the descriptive analysis of participants' sociodemographic, cultural, and psychological data. A Chi-square test was applied to compare the group of participants who stated that they did not use technological resources for sexual activity during the COVID-19 pandemic and the group that reported using such resources for sexual activity. Odds ratio analysis was performed using the binary logistic regression model. The model was evaluated by log-likelihood, deviation, z-statistics, Hosmer-Lemeshow R<sup>2</sup>N, Cox-Snell measures (RL2), and Nagelkerke R<sup>2</sup>CS, following the Akaike information criterion (AIC) (Lopes *et al.* 2020). The SPSS software was used in these analyses.

## RESULTS

A total of 616 married individuals participated in the survey. The majority were women (n=404, 5.6%), the rest were men (n=180, 29.2%) and others (n = 32, 5.2%). The largest concentration of participants was 31-40 years (39.7%), followed by the 41-50-year age group (25.5%). The sample was predominantly middle-aged with high educational attainment, and 57.6% had university degrees (Table 1).

**Table 1:** Sociodemographic Characteristics Statistics

Characteristic	Total=616, n (%)
<b>Gender</b>	
Men	180 (29.2)
Women	404 (65.6)



**JOURNAL HEALTH AND TECHNOLOGY - JHT**  
**ISSN 2764-7625**

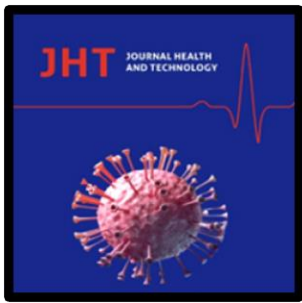
STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
 Isabela Melca, Rachel de Moraes Ferreira, Antonio Egídio Nardi, Anna Lucia Spear King

Others	32 (5.2)
<b>Range of ages (years)</b>	
19-25	13 (2.1)
26-31	62 (10.1)
31-40	241 (39.7)
41-50	157 (25.5)
51-60	94 (15.3)
61-70	49 (8.0)
<b>Education Attainment</b>	
Graduation incomplete	75 (12.2)
Graduated	186 (30.2)
Post graduated	355 (57.6)

The Chi-square test was applied to compare the group of technology users and the control group. As shown in Table 2, the dependent variables were age, gender, schooling, use of digital resources for sexual interaction, the purpose of use of apps, history of mental disorders, whether social distancing during the pandemic had affected sexual behavior, use of social networks, and search for films or series with sexual content during social distancing. Statistical significance was set at 5%.

**Table 2:** Chi-square test among sociodemographic, cultural, and psychological variables and use of technologies during the COVID-19 pandemic in Brazil

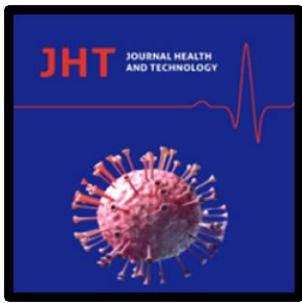
Variable	Not technology use Total(n=468) n(%)	Technology use Total(n=148) n(%)	p-value
<b>Range of age (years)</b>			
19-25	6 (1.3%)	7 (4.7%)	<0.001
26-31	46 (9.9%)	16 (10.7%)	<0.001
31-40	174 (37.3%)	67 (45.0%)	<0.001
41-50	118 (25.3%)	39 (26.2%)	<0.001
51-60	81 (17.3%)	13 (8.7%)	<0.001
61-70	42 (9.0%)	7 (4.7%)	<0.001
<b>Gender</b>			
Others	22 (4.6%)	10 (7.1%)	<0.001
Female	356 (74.9%)	48 (34.0%)	<0.001
Male	97 (20.4%)	83 (58.9%)	<0.001



**JOURNAL HEALTH AND TECHNOLOGY - JHT**  
**ISSN 2764-7625**

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
 Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

<b>Education Attainment</b>			
Graduation incomplete	41 (8.8%)	34 (23.0%)	<0.001
Graduate	147 (31.4%)	39 (23.3%)	<0.001
Postgraduate	280 (43.2%)	75 (50.7%)	<0.001
<b>Digital resources/ sexual Material</b>			
Chat	-	39 (0.7%)	NA
Nude Photos	-	76 (2.1%)	NA
Webcam	-	24 (4.2%)	NA
Audio	-	50 (4.5%)	NA
Phone Calls	-	53 (2.1%)	NA
Video	-	60 (22.0%)	NA
None	468 (100.0%)	-	NA
<b>Purpose of use dating app</b>			
Increase Self-Esteem	11 (2.6%)	17 (6.0%)	<0.001
Reduce boredom of social isolation	13 (3.0%)	40 (14.0%)	<0.001
Entertainment	29 (6.7%)	52 (18.2%)	<0.001
Make friendships	2 (0.5%)	10 (3.5%)	<0.001
Safe sex	3 (0.7%)	11 (3.9%)	<0.001
Virtual sex	5 (1.2%)	22 (7.7%)	<0.001
None	368 (85.4%)	133 (46,7%)	<0.001
<b>Have a previous diagnosis of mental disorder</b>			
Anxiety	176 (37.6%)	69 (46.3%)	<0.001
Depression	130 (27.8%)	42 (28.2%)	<0.001
Social Phobia	14 (3.0%)	4 (2.7%)	<0.001
Panic Disorder	4 (0.9%)	3 (2.0%)	<0.001
Compulsion	38 (8.1%)	9 (6.0%)	<0.001
ADHD	14 (3.0%)	8 (5.4%)	<0.001
Others	10 (2.1%)	8 (5.4%)	<0.001



**JOURNAL HEALTH AND TECHNOLOGY - JHT**  
**ISSN 2764-7625**

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
 Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

None	232 (49.6%)	62 (41.6%)	<0.001
<b>Did you change your Sexual Behavior?</b>			
No (0)	291(62.2%)	69(46.6%)	<0.001
Yes (1)	177 (37.8%)	79 (53.4%)	<0.001
<b>Use of social networks:</b>			
No (0)	448 (95.7%)	111 (75.0%)	<0.001
Yes (1)	20 (4.3%)	37 (25.0%)	<0.001
<b>Consumed of sexual content in series or films</b>			
No (0)	347 (74.1%)	72 (48.6%)	<0.001
Yes (1)	121 (25.9%)	76 (51.4%)	<0.001
<b>Reaching an Orgasm</b>			
No (0)	451(96.4%)	122 (82.4%)	=0.079
Yes (1)	17 (3.6%)	26 (17.6%)	=0.079
<b>Difficult in have a sexual relationship</b>			
No (0)	410 (87.6%)	122 (82.4%)	= 0.127
Yes (1)	58 (12.4%)	26 (17.6%)	= 0.127

Logistic regression analysis at a 5% significance level was used for variables that predicted significant and positive changes in the sexual behavior of married individuals during the pandemic. The following odds ratios were obtained: 5.06 for the male gender, 1.98 for impact on sexual behavior due to social distancing in the pandemic, 7.55 for the use of social networks during the pandemic, 3.08 for the use of erotic content, 3.00 for the use of DTs for sexual satisfaction, and 1.56 for greater ease in reaching orgasm with the use of erotic toys/porn videos. (Table 3)

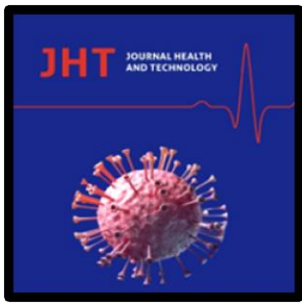
**Table 3:** Significant factors in married couples' sexual behaviors related to use of digital devices during the COVID-19 pandemic, according to binary logistic regression analysis

	B	S.E.	p-valor	Odds ratio	95% C.I.	
					Inferior	Superior
Men	1.622	0.377	<0.0001	5.064	2.418	10.607
Has social isolation affected your sexual behavior?	0.687	0.191	<0.0001	1.988	1.367	2.891
During social distancing due to the pandemic, have you used social networks (Facebook, Twitter, Instagram, others) for the purpose of virtual sex or have you downloaded relationship apps to find new partners?	2.022	0.297	<0.0001	7.551	4.217	13.522
During social distancing due to the pandemic, have you watched more films or series with sexual content in search of pleasure?	1.124	0.196	<0.0001	3.079	2.097	4.520
During social distancing due to the pandemic, have you used technologies (cellphone, computer, others) to obtain sexual pleasure, to reduce possible risks of COVID-19 transmission from face-to-face relationships?	1.743	0.328	<0.0001	5.713	3.002	10.872
Do you think it is easier to reach orgasm with the use of sex toys/porn videos than with a real partner?	0.442	0.195	= 0.024	1.557	1.061	2.283

**DISCUSSION**

The excessive use of DT has been linked to physical and mental disorders, as depression with or without suicidal ideation, anxiety, substance abuse, lack of sleep, increased aggressivity, cognitive impairment, and social isolation (Mboya *et al.* 2020). Social isolation is a cause of distress and is also





## JOURNAL HEALTH AND TECHNOLOGY - JHT ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

associated with a range of mental disorders (Noguera Novoa *et al.* 2023). As a mechanism of copying DT have been used to support humans against feelings of loneliness and social isolation (Brandt *et al.* 2022).

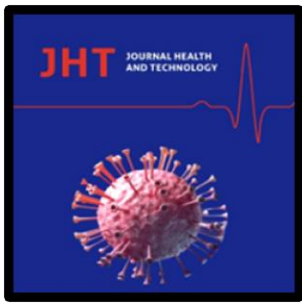
Nowadays, with the advancement of technology digital intimacy has become more present. The term refers to emotional connection, sexual or not, maintained through DT without physical contact. Digital intimacy can occur through text or voice messages, video calls, online dating, and other forms of social media interaction. This kind of interaction is sometimes preferable because of the possibility of anonymity, capacity for self-exploration, and the discovery of the identity, interest, and desires (Be known therapy, 2023). However, most of the time, relations created by the DT are superficial and brief. The abundance of choices and excessive exposure to others lead to excessive pressure, feeling of judgment, a sense of disconnection and loneliness (Paestry, 2023).

In couples, the technologies provide positive and negative consequences. In strengthening the relationships technology can improve communication in couples through being in touch with the partner no matter the distance and enhancing access to information by advice and counselling in the relationships. Technology also can make the marriage worse. The feeling of neglect and resentment can appear when a partner spends too much time using digital devices. Another aspect is the emergence of jealousy and mistrust. Also, as a way of straining couples, internet addiction, mainly pornography creates tension, and conflicts and diminishes sexual interest in the partner (Conradie, 2023).

Sexual activity brings pleasure and intimacy to the couple and contributes to physical and mental health (Cabello *et al.* 2020). The restrictive measures during quarantine raised academic interest in sexual behavior (Döring 2020). Couples have to spend more time together with social distancing in the lockdown (Li *et al.* 2020; Döring, 2020). In this context, DTs appear to have provided a way to mitigate the impact of anxiety caused by social distancing.

Although there is relative gender equality in the use of DTs, women appear to enjoy the technology more and have more depression rates (Falek *et al.* 2022). The principal purpose for women to use DT are research, while men use DTs for entertainment. Most participants in this survey were women (n=404) who used DTs. These findings are consistent with those of Ansari and Baumeister (Baumeister *et al.* 2001), who reported that women used more messaging and mobile devices and accessed more social networks. Women also spend more time than men surfing the web. The longer a person uses DT, the more likely to become addicted to the Internet and, consequently, to have a mental disorder (Mboya *et al.* 2020).

Women also develop more online friendships than men (Harris and Aboujaoude 2016). When comparing sexual behavior and the use of digital devices during the COVID-19 pandemic, being a man presents a significant factor. They also access dating apps more frequently, probably because men tend



## JOURNAL HEALTH AND TECHNOLOGY - JHT ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

to think more about sex and seek more sex eagerly, and mobile devices can be a source of pleasure, entertainment, and porn access (Baumeister 2001; Anshari *et al.* 2016).

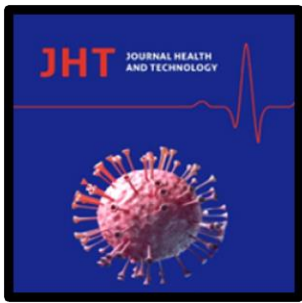
The likelihood of answering an online survey depends on age, gender, and schooling. For example, women, married individuals, and elders are the most accessible participants (Sjetne *et al.* 2019). However, according to age, older people (in their seventies or older) have more difficulty engaging in online surveys (Meier; Tunger 2018). These findings also appeared in this survey. Most respondents were women 30 to 50 years of age with high educational attainment. Schooling plays an important role: higher education tends to be associated with less easygoing attitudes (Anshari *et al.* 2016). In this context, more educated individuals may be more prone to using DTs, as shown in the survey, to entertainment and cope with this personality trait.

During the COVID-19 pandemic, some couples have experienced breaks in their routine and spent more time together. Like this survey, several studies have shown changes in couples' sexual behaviors (Cabello *et al.* 2020; Li *et al.* 2020; Döring, 2020). To cope with social distancing and sexual monotony and to mitigate stress, some married people have turned to digital resources such as chats, nude photos, audio, and phone calls with sexual material, as shown in this study.

DTs have also been used to improve sexual activity and reach sexual satisfaction (Cabello *et al.* 2020). Due to social distancing, people have had to find creative ways to spend time; one way has been consuming pornography. Pornography (porn) is a common practice among people, increasing pleasure in general, and not used only for masturbation. Sexual arousal and enhancing sexual pleasure are the principal motivations for watching porn. During the pandemic, porn has been used to cope with boredom and psychological distress and relieve negative feelings and anxiety. An increase in porn consumption has thus been observed during the pandemic (Zattoni *et al.* 2021). Meanwhile, it is essential to note that excessive consumption of porn can hurt the brain and may increase sexual violence (Döring, 2020).

Digital technologies are becoming intimate and impacting intimacy. The present study showed that people who use DTs achieve a greater sexual satisfaction. The hypothesis is that DTs diminish inhibition and favor sexual self-disclosure. Another theory is that using DTs during sex provides different behavioral, physical, emotional, and cognitive experiences, creating a more fulfilling, affirmative, and rewarding kind of sex (Lomanowska; Guitton 2016; Ibarra *et al.* 2020). According to this survey, the use of social media during the pandemic has contributed to changes in sexual behavior. The use of dating apps has allowed a new form of relationships, presented a variety of possible matches, and brought people closer during the pandemic.

Men use more of dating apps and engage more in casual sex (Castro; Barrada 2020); this was corroborated by the survey's results, in which men increased the change in their sexual behavior during the pandemic by more than five times and the use of social networks by more than three times. The main stated purpose for dating apps has been entertainment, and multiple matches have probably



## JOURNAL HEALTH AND TECHNOLOGY - JHT ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

reduced the likelihood of lasting interpersonal relations, an ideal situation for casual sex. Thus, less commitment has translated into more entertainment for these individuals.

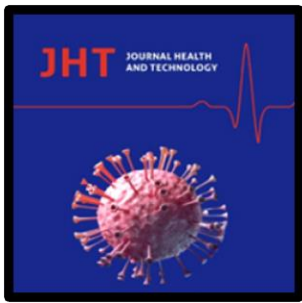
More than 58% of the group that used DTs in this survey had a history of prior mental diagnosis, compared to 50.4% who had a prior diagnosis and did not use such technologies. DT seems to be the second leading cause of disability among psychiatric disorders (Paul *et al.* 2021). Besides, evidence suggests that social distancing increases the incidence of depression and anxiety and can exacerbate preexisting mental disorders (Zubair *et al.* 2023). Anxiety, depression, and ADHD were the most prevalent disorders in this study.

Although several studies have shown that internet addiction (IA) can lead to academic, workplace, and social impairment (Cárdenas Garza *et al.* 2022), it is still not considered a disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V). Excessive use of digital media has been related to mental disorders, mainly stress, anxiety, and depression (Anshari *et al.* 2016). There have been three main hypotheses: depression or depressive symptoms may predict internet addiction (Anand *et al.* 2018; Balhara *et al.* 2021), depression is the major comorbid disorder with IA (Carli *et al.* 2013; Gedam *et al.* 2016, 2017), and IA increases the odds of depression (Ching *et al.* 2017; Boonvisudhi; Kuladee 2017). Some studies have shown that internet addiction correlates with anxiety (Capetillo-Ventura; Juárez-Treviño 2015; Gedam *et al.* 2017), but only one study has found an association with ADHD (Shi; Du 2019).

Psychiatric disorders appear to contribute to changes in sexual behavior. Sexual activity favors psychological well-being because it improves mood and diminishes anxiety, especially during confinement in the pandemic. Individuals who enjoy sexual satisfaction have better mental health outcomes (Cabello *et al.* 2020). Thus, more than 58% of participants may have altered their sexual behavior due to psychiatric disorders. Anxiety and depression are also common factors in impaired sexual activity. They may be responsible for erectile dysfunction and premature ejaculation in men or lack of libido, hypoactive sexual desire, and inability to achieve orgasm in women (Harris; Aboujaoude 2016). In the current survey, people may have used DTs more to achieve orgasm, perhaps again due to their psychiatric disorders. These findings suggest that psychiatric disorders may make people more prone to use DTs to relieve their symptoms and that DTs are a way to cope with psychiatric symptoms, besides contributing to more satisfying sexual experiences.

### RECOMENDATIONS

The survey results show a change in people's sexual behavior through digital devices. DTs seem to support an alternative sexual activity because they explore couples' sexual fantasies and lower individuals' inhibitions. There is little scientific data on how the internet impacts the sexual behavior of people with TDs. Therefore, further studies are needed to obtain more data on sexual activity and TDs. It is also relevant to know how DTs act on psychiatric disorders, increasing or decreasing psychiatric



## JOURNAL HEALTH AND TECHNOLOGY - JHT ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

symptoms. Longitudinal research is needed on using DTs, which is particularly important for understanding human behavior's positive and negative consequences.

### LIMITATIONS

This survey presents some limitations. The questionnaire app was self-designed and self-reported. Self-reported questionnaires can be influenced by psychological and sociological experiences and particular contexts. Although this was an anonymous survey, questions about sex can cause feelings of shame or guilt, and respondents may not be truthful (Razavi, 2001). Thus, was also a cross-sectional study so that no causal associations could be inferred. Facebook is a promising research tool, favoring recruitment, but users tend to be less interested in health research than other topics. In addition, this social media is not representative of the total population because most users were women, young adults, and with university education and higher incomes (Whitaker *et al.* 2017). Another limitation was that we did not collect e-mails from participants to ensure total anonymity, and duplicate entries may have occurred.

### DECLARATIONS

Funding: There was no funding for this work.

Conflicts of interest/Competing interests: The authors state that there are no conflicts of interest.

Availability of data and material: Not applicable

Code availability: Not applicable

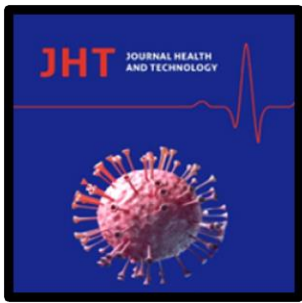
### REFERENCES

ANAND, N.; THOMAS, C.; JAIN, P. A. *et al.* Internet use behaviors, internet addiction and psychological distress among medical college students: A multi centre study from South India. **Asian Journal of Psychiatry**, v. 37, p. 71–77, 2018. <https://doi.org/10.1016/j.ajp.2018.07.020>

ANSHARI, M.; ALAS, Y.; HARDAKER, G. *et al.* Smartphone habit and behavior in Brunei: Personalization, gender, and generation gap. **Computers in Human Behavior**, v. 64, p. 719–727, 2016. <https://doi.org/10.1016/j.chb.2016.07.063>

BALHARA, Y. P. S.; SINGH, S.; SAINI, R. *et al.* Should Internet gaming disorder be considered a subtype of generalized problematic internet use? Findings from a study among medical college students. **Perspect Psychiatr Care**, v. 57, p. 272–278, 2021. <https://doi.org/10.1111/ppc.12558>

BAUMEISTER, R. F. Social psychology and human sexuality: essential readings. **Psychology Press**, 2001.



BAUMEISTER, R. F.; CATANESE, K. R.; VOHS, K. D. Is There a Gender Difference in Strength of Sex Drive? Theoretical Views, Conceptual Distinctions, and a Review of Relevant Evidence. **Pers Soc Psychol Rev.**, v. 5, p. 242–273, 2001. [https://doi.org/10.1207/S15327957PSPR0503\\_5](https://doi.org/10.1207/S15327957PSPR0503_5)

BE KNOWN THERAPY. The rise of virtual intimacy: pros and cons of digital connections. **Be Known Therapy**, 2023. <https://www.beknowntherapy.com/blog/virtual-intimacy>. Accessed 27 Dec 2023

BOONVISUDHI, T.; KULADEE, S. Association between Internet addiction and depression in Thai medical students at Faculty of Medicine, Ramathibodi Hospital. **PLoS ONE**, v. 12, p. e0174209, 2017. <https://doi.org/10.1371/journal.pone.0174209>

BRANDT, L.; LIU, S.; HEIM, C.; HEINZ, A. The effects of social isolation stress and discrimination on mental health. **Transl Psychiatry**, v. 12, p. 398, 2022. <https://doi.org/10.1038/s41398-022-02178-4>

BZDOK, D.; DUNBAR, R. I. M. Social isolation and the brain in the pandemic era. **Nat Hum Behav.**, v. 6, p. 1333–1343, 2022. <https://doi.org/10.1038/s41562-022-01453-0>

CABELLO, F.; SÁNCHEZ, F.; FARRÉ, J. M.; MONTEJO, A. L. Consensus on Recommendations for Safe Sexual Activity during the COVID-19 Coronavirus Pandemic. **JCM**, v. 9, p. 2297, 2020. <https://doi.org/10.3390/jcm9072297>

CAI, H.; XI, H.; ZHU, Q. *et al.* Prevalence of problematic Internet use and its association with quality of life among undergraduate nursing students in the later stage of COVID-19 pandemic era in China. **Am J Addict.**, v. 30, p. 585–592, 2021. <https://doi.org/10.1111/ajad.13216>

CAPETILLO-VENTURA, N.; JUÁREZ-TREVIÑO, M. Internet addiction in university medical students. **Medicina Universitaria**, v. 17, p. 88–93, 2015. <https://doi.org/10.1016/j.rmu.2015.02.003>

CÁRDENAS GARZA, S. A.; JANSSEN AGUILAR, R.; RUÍZ CHOW, Á. A. Problematic Internet Use and Personality Traits: Results in Working Age Adults. **Revista Colombiana de Psiquiatría** S0034745022000270, 2022. <https://doi.org/10.1016/j.rcp.2022.03.002>

CARLI, V.; DURKEE, T.; WASSERMAN, D. *et al.* The Association between Pathological Internet Use and Comorbid Psychopathology: A Systematic Review. **Psychopathology**, v. 46, p. 1–13, 2013. <https://doi.org/10.1159/000337971>

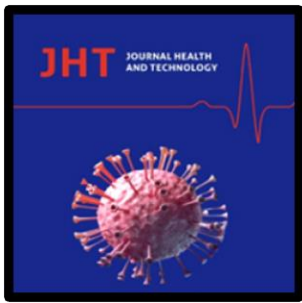
CASTRO, Á.; BARRADA, J. R. Dating Apps and Their Sociodemographic and Psychosocial Correlates: A Systematic Review. **IJERPH**, v. 17, p. 6500, 2020. <https://doi.org/10.3390/ijerph17186500>

CDC. **WHO downgrades COVID pandemic, says it's no longer a global emergency.** [S. l.]: CDC, 2023. <https://www.cbc.ca/news/health/who-pandemic-not-emergency-1.6833321>. Accessed 21 May 2023

CHING, S. M.; HAMIDIN, A.; VASUDEVAN, R. *et al.* Prevalence and factors associated with internet addiction among medical students - A cross-sectional study in Malaysia. **Med J Malaysia**, v. 72, p. 7–11, 2017.

CIPRIANO, M.; GIACALONE, A.; RUBERTI, E. Sexual behaviors during COVID-19: the potential risk of transmission. **Archives of Sexual Behavior**, v. 49, p. 1431–1432, 2020.

CONRADIE, C. **The impact of technology on modern marriage.** [S. l.: s. n.], 2023. <https://medium.com/@cassandraconradie/the-impact-of-technology-on-modern-marriages-39e5dd510a02>. Accessed 27 Dec 2023



COURTICE, E. L.; SHAUGHNESSY, K. Technology-mediated sexual interaction and relationships: a systematic review of the literature. **Sexual and Relationship Therapy**, v. 32, p. 269–290, 2017. <https://doi.org/10.1080/14681994.2017.1397948>

DÖRING, N. How Is the COVID-19 Pandemic Affecting Our Sexualities? An Overview of the Current Media Narratives and Research Hypotheses. **Arch Sex Behav.**, v. 49, p. 2765–2778, 2020. <https://doi.org/10.1007/s10508-020-01790-z>

FALEK, I.; ACRI, M.; DOMINGUEZ, J. *et al.* Management of depression during the perinatal period: state of the evidence. **Int J Ment Health Syst.**, v. 16, n. 21, 2022. <https://doi.org/10.1186/s13033-022-00531-0>

GAVIN, B. **The Beginner's Guide to Google Forms**. How-to Geek [Viitattu 2210 2019] Saatavissa [s.n.], 2019. <https://www.howtogeek.com/434570/the-beginners-guide-to-google-forms>

GEDAM, S.; GHOSH, S.; MODI, L. *et al.* Study of internet addiction: Prevalence, pattern, and psychopathology among health professional undergraduates. **Indian J Soc Psychiatry**, v. 33, p. 305, 2017. [https://doi.org/10.4103/ijsp.ijsp\\_70\\_16](https://doi.org/10.4103/ijsp.ijsp_70_16)

GEDAM, S. R.; SHIVJI, I. A.; GOYAL, A. *et al.* Comparison of internet addiction, pattern and psychopathology between medical and dental students. **Asian Journal of Psychiatry**, v. 22, p. 105–110, 2016. <https://doi.org/10.1016/j.ajp.2016.06.007>

GONÇALVES, L. L.; NARDI, A. E.; KING, A. S. Home office in the COVID-19 pandemic: Impacts on human behavior. **Computers in Human Behavior**, v. 29, p. 140–144, 2020.

GUEDES, E.; NARDI, A. E.; GUIMARÃES, F. M. C. L. *et al.* Social networking, a new online addiction: a review of Facebook and other addiction disorders. **Medical Express**, v. 3, 2016.

HARRIS, K. M.; ABOUJAUDE, E. Online Friendship, Romance, and Sex: Properties and Associations of the Online Relationship Initiation Scale. **Cyberpsychology, Behavior, and Social Networking**, v. 19, p. 487–493, 2016. <https://doi.org/10.1089/cyber.2016.0164>

IBARRA, F. P.; MEHRAD, M.; MAURO, M. D. *et al.* Impact of the COVID-19 pandemic on the sexual behavior of the population. The vision of the east and the west. **International braz j urol.**, v. 46, p. 104–112, 2020.

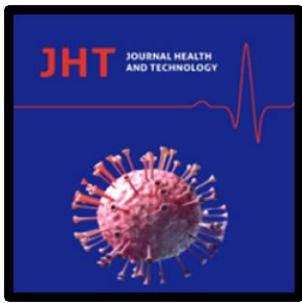
LI, G.; TANG, D.; SONG, B. *et al.* Impact of the COVID-19 Pandemic on Partner Relationships and Sexual and Reproductive Health: Cross-Sectional, Online Survey Study. **J Med Internet Res**, v. 22, p. e20961, 2020. <https://doi.org/10.2196/20961>

LOMANOWSKA, A. M.; GUITTON, M. J. Online intimacy and well-being in the digital age. **Internet Interventions**, v. 4, p. 138–144, 2016. <https://doi.org/10.1016/j.invent.2016.06.005>

LOPES, G. P.; VALE, F. B. C.; VIEIRA, I. *et al.* COVID-19 and Sexuality: Reinventing Intimacy. **Arch Sex Behav.**, v. 49, p. 2735–2738, 2020. <https://doi.org/10.1007/s10508-020-01796-7>

MBOYA, I. B.; LEYARO, B. J.; KONGO, A. *et al.* Internet addiction and associated factors among medical and allied health sciences students in northern Tanzania: a cross-sectional study. **BMC Psychol**, v. 8, p. 73, 2020. <https://doi.org/10.1186/s40359-020-00439-9>

MEIER, A.; TUNGER, D. Survey on opinions and usage patterns for the ResearchGate platform. **PLoS ONE**, v. 13, p. e0204945, 2018. <https://doi.org/10.1371/journal.pone.0204945>



## JOURNAL HEALTH AND TECHNOLOGY - JHT

### ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

MELCA, I. A.; NARDI, A. E.; GONÇALVES, L. L. *et al.* Sex, digital devices, social media, and social isolation: A study on sexual behavioral during COVID-19 pandemic. *Clinical practice and epidemiology in mental health*. **CP & EMH**, v. 17, p. 235, 2021.

MORENO-GUERRERO, A-J.; GÓMEZ-GARCÍA, G.; LÓPEZ-BELMONTE, J.; RODRÍGUEZ-JIMÉNEZ, C. Internet addiction in the web of science database: a review of the literature with scientific mapping. **International Journal of Environmental Research and Public Health**, v. 17, p. 2753, 2020.

NOGUERA NOVOA, C. N.; SARMIENTO-MELENDÉZ, Y. T.; SIERRA-HINCAPIÉ, G. M.; GONZÁLEZ-DÍAZ, J. M. Síntomas depresivos en trabajadores de la salud dos años después del inicio de la pandemia COVID-19 en Bogotá, Colombia. **Revista Colombiana de Psiquiatría**, S0034745023000392, 2023. <https://doi.org/10.1016/j.rcp.2023.04.006>

PAESTRY, R. I. **Navigating digital intimacy**: building meaningful connections in the digital age. [S. l.: s. n.], 2023. <https://medium.com/@retnoika/navigating-digital-intimacy-building-meaningful-connections-in-the-digital-age-97054c0ac177>. Accessed 27 Dec 2023

PAUL, G. M.; NASCIMENTO, B. C.; AFIF-ABDO, J. *et al.* The psychiatric impact of COVID-19 pandemic on sexual health. **Braz J Psychiatry**, v. 43, p. 109–109, 2021. <https://doi.org/10.1590/1516-4446-2020-1197>

RAMO, D. E.; RODRIGUEZ, T. M. S.; CHAVEZ, K. *et al.* Facebook recruitment of young adult smokers for a cessation trial: Methods, metrics, and lessons learned. **Internet Interventions**, v. 1, p. 58–64, 2014. <https://doi.org/10.1016/j.invent.2014.05.001>

RAZAVI, T. **Self-report measures**: An overview of concerns and limitations of questionnaire use in occupational stress research. [S. l.: s. n.], 2001.

SFOGGIA, A.; KOWACS, C. Sexualidade e novas tecnologias. **Revista brasileira de Psicoterapia**, v. 16, p. 4–17, 2014.

SHI, M.; DU, T. J. Associations of personality traits with internet addiction in Chinese medical students: the mediating role of attention-deficit/hyperactivity disorder symptoms. **BMC Psychiatry**, v. 19, p. 183, 2019. <https://doi.org/10.1186/s12888-019-2173-9>

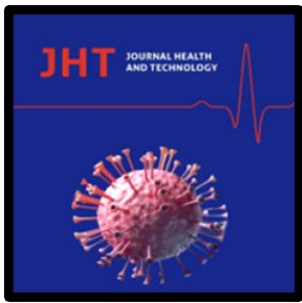
SJETNE, I. S.; IVERSEN, H. H.; HOLMBOE, O.; HELGELAND, J. Response probabilities and response-mode preferences in a self-administered survey. **BMC Res Notes**, v. 12, p. 289, 2019. <https://doi.org/10.1186/s13104-019-4328-7>

VASANTHA RAJU, N.; HARINARAYANA, N. **Online survey tools**: A case study of Google Forms. [S. l.: s. n.], 2016.

WHITAKER, C.; STEVELINK, S.; FEAR, N. The Use of Facebook in Recruiting Participants for Health Research Purposes: A Systematic Review. **J Med Internet Res.**, v. 19, p. e290, 2017. <https://doi.org/10.2196/jmir.7071>

WHITE, G. **Technology Use and Mental Health Disorders**: Dueling Aspects of Technology as a Problem and a Solution for Mental Health. [S. l.: s. n.], 2023.

WIJAYA, R. P. C.; BUNGA, B. N.; KILING, I. Y. Socio-emotional struggles of young children during COVID-19 pandemic: Social isolation and increased use of technologies. **Journal of Early Childhood Research**, v. 20, p. 113–127, 2022. <https://doi.org/10.1177/1476718X211052789>



## JOURNAL HEALTH AND TECHNOLOGY - JHT ISSN 2764-7625

STUDY OF CHANGES IN SEXUAL BEHAVIOR IN COUPLES FACING DIGITAL TECHNOLOGIES  
Isabela Melca, Rachel de Moraes Ferreira, Antonio Egidio Nardi, Anna Lucia Spear King

ZATTONI, F.; GÜL, M.; SOLIGO, M. *et al.* The impact of COVID-19 pandemic on pornography habits: a global analysis of Google Trends. **Int J Impot Res.**, v. 33, p. 824–831, 2021. <https://doi.org/10.1038/s41443-020-00380-w>

ZUBAIR, U.; KHAN, M. K.; ALBASHARI, M. Link between excessive social media use and psychiatric disorders. **Annals of Medicine & Surgery**, v. 85, p. 875–878, 2023. <https://doi.org/10.1097/MS9.000000000000112>