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ORIGINAL PAPER

(Un)forgotten Sex Lives During the COVID-19 Pandemic: Coping Strategies That Work and the Role of Experience

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Abstract

Available literature points to a worsening trend in sexual functioning, desire, and satisfaction during the pandemic. Nevertheless, virtually no empirical research was conducted on the mechanisms of coping with the pandemic's impacts on sex life. Thus, the purpose of this exploratory study was to examine a variety of coping mechanisms and their perceived usefulness by people who have and have not tried these coping strategies to maintain and enhance their sex lives during the first year of the pandemic. The cross-sectional data were collected using an online survey methodology ($N = 420$; 66.9% women) and analyzed utilizing exploratory factor analysis, analysis of variance, and multiple regression. The results revealed nine factors/coping mechanisms (based on 59 items/strategies), including goal-setting strategies, risk and experimentation strategies, relational strategies, caution and logistical strategies, creativity and innovation strategies, substances and context-related strategies, online and technology strategies, diversion strategies, and educational strategies. Consistently, across all the specific coping strategies and overall coping mechanisms, people who tried them found them significantly more useful than those who had not tried these coping strategies. Moreover, a higher diversity of tried strategies per coping mechanism consistently and significantly predicted the perceived usefulness of that coping mechanism. These results emphasize the crucial role of experience with coping mechanisms and show that amidst COVID-related adversity and challenges, many people found ways to adapt their sex lives and enjoy silver-lining opportunities. This exploratory study offers promising evidence for potential sexual coping strategies during times of stress that could be informative for clinical practice and education.

Keywords COVID-19 pandemic · Sexual coping · Sexual behavior · Sexual relationship · Technology

Introduction

Throughout the COVID-19 pandemic, governments across the globe have been adopting non-pharmaceutical mitigation measures (e.g., stay-at-home orders, physical distancing, school closures, travel bans, limitations on large gatherings) to mitigate the virus' spread. These measures have introduced hardships to people's lives across the globe, and our sex lives are not an exception. Specifically, studies have indicated adverse tendencies in people's mental health and well-being, including increased rates of stress, anxiety, and depression that, in turn, negatively affected people's social and sexual connections, sexual desire and behavior, and sexual and overall health (Balzarini et al., 2022; Lorentz et al., 2021; Rosenberg et al., 2021; Zhang et al., 2021). During the pandemic, and especially during the periods of lockdown, individuals and couples experienced isolation, distress, and escalated coronavirus-related conflict, combined with the limited or altered access to counseling and therapy (e.g., move to teletherapy instead of in-person meetings) (Ibarra et al., 2020; Luetke et al., 2020). Hence, a critical issue that needs to be addressed by sexual health researchers and practitioners is how to maintain safe and rewarding sexual and intimate relationships during and after the pandemic while keeping alive the sense of adventure, excitement, and pleasure (Ibarra et al., 2020).

Despite its devastating effects, the pandemic "has opened an unprecedented line of research aimed at exploring human sexuality" (Pascoal et al., 2021, p. 2). The state of research on the nexus of COVID-19, related prevention measures, and sexuality is developing but still germinal (Pascoal et al.,

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2021). Nevertheless, the available evidence indicates meaningful and diverse changes in people's sex lives, with declines in sexual desire, frequency, quality, and satisfaction being reported most commonly (cf. de Oliveira & Carvalho, 2021; Delcea et al., 2021), yet, with some people experiencing no changes or even improvements in sex life (cf. Cascalheira et al., 2021; Hensel et al., 2020; Lehmiller et al., 2020).

Although sex life might not have been the primary concern during the initial outbreak of the coronavirus, it is essential to understand the continuous impacts of the pandemic on sex life and the strategies people employed to adjust to the new reality (Berdychevsky et al., 2021; Pascoal et al., 2021; Schiavi et al., 2020). Learning how people chose to cope with the pandemic in the absence of (or limited) access to professional resources will offer valuable lessons to both researchers and practitioners by increasing our understanding of people's coping propensity during times of the public health crises and identifying the strategies that work as well as for whom they work and for whom they do not work.

Despite the importance of developing an understanding of these coping mechanisms, a thorough literature review revealed that most (albeit not all) available studies have focused on the description of changes in sex life during the early stages of the pandemic (cf. Cascalheira et al., 2021; Coombe et al., 2021; Hensel et al., 2020; Kaya et al., 2021; Li et al., 2020b; Panzeri et al., 2020), while very little empirical research was conducted on the various mechanisms of coping with the impacts of the pandemic on sex life. Indeed, only a few examples of conceptual prescriptive articles for sexual health educators and practitioners were identified (Dewitte et al., 2020; O'Reilly Treter et al., 2021; Pereira Lopes et al., 2020). Also, scarce empirical research on sexual coping during the pandemic has focused on particular coping strategies, such as relational coping or using technology (e.g., Goss et al., 2022; Grubbs et al., 2022; Luetke et al., 2020), instead of studying a complex variety of the coping mechanisms. Thus, the purpose of this exploratory study was to address this gap, and the aims were twofold. The first aim was to investigate holistically a variety of coping mechanisms that people have been implementing during the first year of the pandemic to negotiate the impacts of the pandemic on their sex lives. The second aim was to elucidate the importance of experience by comparing people's perceptions of coping usefulness based on whether they have tried or have not tried a given strategy.

Sex Life During the Pandemic and Other Crises

Sexual functioning should be framed within a contextual perspective, which brings to the forefront the impacts of the stressors brought about by the pandemic and people's capacity for psychological adjustment to these stressors (Carvalho et al., 2021; Rodrigues & Lehmiller, 2022). Early speculations in the sexual health community and the broader public were polarized, with some predicting an increase in sexual activity leading to a baby boom and others arguing that the pandemic-related stress and struggles act as erotic killers leading to a baby bust (Cito et al., 2021; Coombe et al., 2021; Ibarra et al., 2020). Indeed, pandemics and natural disasters can be a double-edged sword for intimate and sexual relationships as they can cause both deteriorations (due to stress, trauma, and conflict) and improvements (due to mutual support, bonding, and positive coping) in the quality of sex lives and relationships (Fredman et al., 2010; Marshall & Kuijer, 2017; Plusnin et al., 2018).

On the one hand, hurricanes and earthquakes have been associated with significant reductions in the frequency of sexual activity, sexual desire, satisfaction, and reproductive plans (Kissinger et al., 2007; Liu et al., 2010). Natural disasters have also been linked to increased divorce rates and intimate partner violence (Cohan & Cole, 2002; Rao, 2020). On the other hand, an increase in fertility was observed after the high-mortality Indonesian tsunami in 2004 (Nobles et al., 2015). Some scholars argue that mortality salience during times of crisis increases some people's sexual desire and motivates them to seek solace and support in their relationships (Pennanen-Iire et al., 2021; Rodrigues & Lehmiller, 2022), while sexual activity is a relationship maintenance mechanism (Birnbaum & Reis, 2019).

The impacts of COVID-19 and related non-pharmaceutical mitigation measures on people's sexual desire, expression, function, and satisfaction have been studied across the globe, including in the United States (Craig-Kuhn et al., 2021; Hensel et al., 2020; Luetke et al., 2020), the United Kingdom (Cascalheira et al., 2021; Mitchell et al., 2023; Wignall et al., 2021), China (Li et al., 2020b; Zhang et al., 2021), Italy (Caruso et al., 2020; Cito et al., 2021; De Rose et al., 2021), Australia (Coombe et al., 2021; Dacosta et al., 2021), Turkey (Karsiyakali et al., 2021; Kaya et al., 2021), Germany (Hille et al., 2021; Mumm et al., 2021), Portugal (Carvalho et al., 2021; Pascoal et al., 2021), Poland (Fuchs et al., 2020), Kenya (Osur et al., 2021), Egypt (Omar et al., 2021), Spain (Ballester-Arnal et al., 2020), and Brazil (Lorentz et al., 2021). This literature showed various trends in COVID-19's impacts on people's sex lives.

However, systematic literature reviews and meta-analyses point to an overall declining/worsening trend in sexual functioning, desire, and satisfaction during the pandemic among both partnered and non-partnered people (de Oliveira & Carvalho, 2021; Delcea et al., 2021). Physical confinement, loss of work, economic challenges, separation from a partner or intense (in some cases, forced) togetherness, and uncertainty about the future inevitably lead to difficulties in sex life and might even trigger breakups, infidelity, and domestic violence (Bradbury-Jones & Isham, 2020; Coop Gordon & Mitchell, 2020; Ibarra et al., 2020; Taub, 2020). More than

ever, the benefits of maintaining a satisfying and healthy sex life during and after the pandemic and harnessing its qualities should be a priority (Cabello et al., 2020).

Sexual Well-Being and Coping During the Pandemic

Sexual well-being can be viewed as an indicator of mental well-being during the COVID-19 pandemic (Ibarra et al., 2020; Maretti et al., 2020; Mumm et al., 2021). A holistic view of health and a positive approach to sexuality recognize the importance of satisfying sexual relationships and effective sexual communication to promote self-esteem and well-being (Berdychevsky & Carr, 2020; Ibarra et al., 2020; Starrs et al., 2018; Williams et al., 2020). Sexual satisfaction has been linked to general health and well-being (Davison et al., 2009; Giami, 2021). Sexual desire and satisfaction affect the quality of relationships in general (McNulty et al., 2016; Meltzer et al., 2017) and during the pandemic (Li et al., 2020a). The increased sexual activity contributes to greater enjoyment of life (Smith et al., 2019). Since sexuality is widely regarded as one of the central dimensions of health, difficulties and barriers to sexual expression caused by the COVID-19 pandemic and related mitigation measures should be seen as potential health problems and risk factors (Giami, 2021). Sexual rights must be safeguarded during public health crises, yet sexual health and well-being are often neglected in the face of immediate significant concerns, like the pandemic (de Oliveira & Carvalho, 2021).

Nevertheless, it is plausible that maintaining, enhancing, or reintroducing sexual activity into a person's life can serve as a protective buffer and help mitigate some of the negative impacts of the COVID-19 pandemic and related social distancing measures (Jacob et al., 2020; Maretti et al., 2020; Mollaioli et al., 2021). Some people use sex as a coping mechanism with stress in general and during the COVID-19 pandemic (Gillespie et al., 2021; Jaspal et al., 2021; Maretti et al., 2020). Sexual activity can also be used to overcome boredom, stress, and anxiety, which were likely to increase with prolonged self-isolation during the COVID-19 pandemic (de Oliveira & Carvalho, 2021; Gilespie et al., 2021; Jacob et al., 2020; Lehmiller et al., 2020). Consequently, studies of sexual behavior during the pandemic found that maintaining or enhancing sexual activity despite (or due to) adversity contributed to better mental health outcomes (e.g., lower stress, anxiety, and mood disorders), higher levels of resilience, and better satisfaction with sex life and relationships (Coronado et al., 2021; Lehmiller et al., 2020; Mollaioli et al., 2021; Rosenberg et al., 2021). Thus, sexual activity could be a valuable aid in reducing the onset of post-traumatic stress and anxiety disorders during lockdowns and quarantine periods of this and future public health crises (Cabello et al., 2020).

What remains to be studied is how people cope with the impacts of the pandemic and related prevention measures on their sex lives. Some commentaries and empirical studies have cursorily addressed certain aspects of sexual coping during the pandemic, such as relational coping strategies (e.g., Luetke et al., 2020; Rosenberg et al., 2021), experimentation and expansion of sexual repertoire during the pandemic (Ballester-Arnal et al., 2020; Cabello et al., 2020; Goss et al., 2022; Lehmiller et al., 2020), and the use of technology, including porn consumption, dating app use, cybersex, and sex toys/aids use (Coombe et al., 2021; Grubbs et al., 2022; Mestre-Bach et al., 2020; Rodrigues, 2021). Sexologists emphasized that technology might play a crucial role in helping people adjust to social isolation by offering a means for sexual expression, pleasure, and safe sex (Pascoal et al., 2021). Therefore, pornography consumption and sexting might serve adaptive purposes during the pandemic (Lehmiller et al., 2020; Mestre-Bach et al., 2020). Technology shaped sex lives and relationships even before the pandemic (Lomanowska & Guitton, 2016). Nevertheless, the pandemic has contributed to the roles of technology in people's sex lives in unprecedented ways, and it offers vital avenues for increasing the diversity of people's sexual repertoires (Lehmiller et al., 2020; Pascoal et al., 2021). Therefore, it is crucial to study holistically the variety of coping mechanisms that people have been employing and found useful (or useless) during the COVID-19 pandemic.

This Study

Sexuality is central to health and well-being even (and maybe even more) during the pandemic (Hensel et al., 2020). Thus, a critical piece of public health prevention and management responses should be available to ensure the availability of proper resources and services supporting people's positive sexual decision making and coping processes with the impacts of the pandemic on their sex lives (de Oliveira & Carvalho, 2021; Hensel et al., 2020; Jacob et al., 2020). However, insufficient research and public attention have been focused on maintaining sexual health and well-being during the COVID-19 pandemic, despite its importance to the overall quality of life (Giami, 2021; Ibarra et al., 2020; Pennanen-Iire et al., 2021). Consequently, we still have more questions than answers about the coping strategies people used (and found useful) to navigate and mitigate the impacts of the pandemic on their sex lives. Given the complexity of the COVID-19 pandemic's impacts on people's sex lives, it is essential to study how they have adapted to this situation and what coping strategies they found useful (Pascoal et al., 2021; Schiavi et al., 2020). Thus, the purpose of this exploratory study was to examine a variety of coping mechanisms and their perceived usefulness by people who have and have not tried these coping strategies to maintain and enhance their

sex lives during the first year of the pandemic. Specifically, the study addressed the following research questions (RQs):

RQ1: What are the dimensions of coping (i.e., the coping mechanisms) with the impacts of the COVID-19 pandemic on sex life?
RQ2: Are there differences in the perceived usefulness of the coping mechanisms (from RQ1) between people who have and have not tried them?
RQ3: Does the diversity of the tried strategies within each coping mechanism (from RQ1) predict the perceived usefulness of the given coping mechanism as a whole?

Method

Participants

The final sample for the analysis ($N = 420$) had 281 (66.9%) women, 127 (30.2%) men, and 12 (2.9%) who self-identified differently. They ranged in age from 18 to 75 years old ($M = 31.11$, $SD = 12.68$). The majority (293, 69.8%) of the participants self-identified as White/Caucasian, 77 (18.3%) as Asian, 18 (4.3%) as Black, and 14 (3.3%) as Hispanic. In terms of education, 39 (9.3%) respondents were high school graduates, 12 (2.9%) were trade school graduates, 96 (22.9%) completed some college, 149 (35.5%) had a Bachelor's degree, 85 (20.2%) had a Master's degree, and 34 (8.1%) had a Ph.D., M.D., or equivalent degree.

Among the participants, 204 (48.6%) were never married, 136 (32.4%) were married, 62 (14.8%) were living with a partner, and 18 (4.2%) were divorced. In addition, 313 (74.5%) had a regular sex partner and 60 (14.3%) had a casual sex partner(s), meaning that 88.8% of the sample engaged in dyadic sexuality. Among the celibate participants, only 15 (3.6%) reported not masturbating, meaning that 96.4% of the sample engaged in dyadic or autoerotic sexuality during the pandemic. This diversity was instrumental to capturing diverse sexual coping mechanisms. The majority (317, 75.5%) of the sample self-identified as heterosexual, 71 (16.9%) as bisexual, and 19 (4.5%) as gay/lesbian. Also, 323 (76.9%) respondents had no children living in the same household. In terms of employment, 171 (40.7%) respondents were employed full-time, 92 (21.9%) part-time, and 73 (17.4%) were unemployed. The United States (269, 64.0%) and the United Kingdom (68, 16.2%) were the most frequently reported countries of residence.

On average, the participants in this study self-identified as healthy ($M = 3.89$, $SD = 0.82$) (absolute range, 1–5). In terms of adjustment to the lockdown conditions, 55 (13.1%) participants felt that they were adjusting extremely well, 209 (49.8%) somewhat well, 89 (21.2%) neither well nor poorly, 55 (13.1%) somewhat poorly, and 12 (2.9%) extremely poorly ($M = 3.57$, $SD = 0.97$). Finally, 87 (20.7%) participants described their average stress levels during the pandemic as much higher compared to pre-pandemic, 209 (49.8%) as higher, 86 (20.5%) as about the same, 30 (7.1%) as lower, and 8 (1.9%) as much lower ($M = 3.80$, $SD = 0.91$). For additional details regarding the sociodemographic profile of the sample, including the impacts of the pandemic, see Table 1.

Procedure

The cross-sectional data were collected using an online survey methodology, utilizing the Qualtrics platform. Convenience, volunteer-based sampling was implemented. Participants received no incentives for contributing to this study, but they were offered a summary of its results. The participants were provided with an online informed consent form, and the survey took about 20–25 min to complete. The inclusion criteria for this study were being 18 + years old, speaking English (however, there were no geographic limitations in this study), and being willing to share personal information regarding sex life during the pandemic. The study was anonymous, and no personal identifiers or IP addresses were collected. Given that the study did not offer incentives, the likelihood of including bot-based responses was minimal. Nevertheless, the quality of the included responses was assessed using timestamps, branching logic, duplicate items, open ended questions, and minimum completion times. The data were collected between February and May 2021.

The author and four students recruited participants through word of mouth, social media (Twitter, Facebook, LinkedIn, Instagram), University and Research Center announcements to the community, and email and online announcements in public and registration-requiring forums, groups, websites, and listservs. The announcements in registration-requiring sources were made strictly with the administrator's approval. Announcements were also posted on Reddit (both general and specific sub-Reddits devoted to coronavirus, sex, and relationships), in health and sex-oriented Facebook groups (e.g., Intimacy, Sex and Empowerment; Love, Sex, and Relationships; Wellness and Well-Being; Positive Mind and Body), and topic-specific and general chats, forums, and online communities (e.g., Loveshack, LetsChatLove, TalkHealth, Forumania, Nexopia). To encourage participation among mature audiences, tailored announcements were also posted in forums and Facebook groups targeting older adults (e.g., Early Retirement Extreme Forums, SilverSurfer, 50-Plus Club, Funny Sarcastic Grandma Group, Seniors Club). The recruiting students have also utilized the platforms like Survey Circle, Survey Tandem, and Survey Exchange.

Table 1 Sociodemographic composition of the sample and the impacts of the COVID-19 pandemic

Variable Groups	*n*	%	Variable Groups	*n*	%
Gender			*Sexual identity*		
Men	127	30.2	Heterosexual	317	75.5
Women	281	66.9	Gay/Lesbian	19	4.5
Other	12	2.9	Bisexual	71	16.9
			Other	12	2.9
Age (M = 31.11, *SD* = 12.68, *Min* = 18, *Max* = 75)					
18–23 years old	170	40.5	*Children (living in the same household)*		
24–30 years old	87	20.7	None	323	76.9
31–40 years old	84	20.0	1 child	31	7.4
41–50 years old	38	9.0	2 children	30	7.1
51–60 years old	21	5.0	3–4 children	32	7.6
61 + years old	20	4.8	More than 4	4	1.0
Education			*Children (by age; can have children in different age categories)*		
Preschool through grade 12	5	1.2	Infant (under 1 yo)	45	10.7
High school graduate	39	9.3	Toddler (1–2 yo)	27	6.4
Trade school graduate	12	2.9	Preschooler (3–5 yo)	39	9.3
Some college	96	22.9	Elementary school (6–10 yo)	36	8.6
Bachelor's degree	149	35.5	Middle school (11–14 yo)	22	5.2
Master's degree	85	20.2	High school (15–18 yo)	20	4.8
Ph.D., M.D., or equivalent degree	34	8.1	19–26 yo	17	4.0
Racial and ethnic background[a]			*Employment status*		
White/Caucasian, not of Hispanic origin	293	69.8	Employed full-time	171	40.7
Black, not of Hispanic origin	18	4.3	Employed part-time	92	21.9
Hispanic	14	3.3	Self-employed	18	4.3
Asian	77	18.3	Retired	7	1.7
Other	18	4.3	Unemployed	73	17.4
			Other	59	14.0
Marital status					
Never married	204	48.6	*Impacts of the pandemic*[b]		
Married	136	32.4	Decreased workload (self)	97	23.1
Divorced/separated	18	4.2	Decreased workload (partner)	49	11.7
Living with a partner	62	14.8	Employment/business loss (self)	49	11.7
			Employment/business loss (partner)	25	6.0
Dating status			Increased workload (self)	190	45.2
Exclusive relationship	269	64.0	Increased workload (partner)	88	21.0
Open relationship (can see other people)	9	2.1	Essential worker (self)	114	27.1
Casually dating, but not in a relationship	48	11.4	Essential worker (partner)	79	18.8
Not dating and not in a relationship	72	17.1	Working from home (self)	215	51.2
Other	13	3.1	Working from home (partner)	88	21.0
			Switching kids to online/home schooling	59	14.0
Regular sexual partner			Withdrawing kids from daycare services	15	3.6
Yes	313	74.5	Losing place of residence	4	1.0
No	107	25.5	None of the above	40	9.5

[a]Some race/ethnicity groups were collapsed into the "other" category due to very low frequencies

[b]In the questionnaire, the "partner" was consistently described as a "spouse/cohabitating partner"

Measures

The literature review did not offer a comprehensive instrument measuring behavioral and cognitive sexual coping in response to public health crisis. Moreover, the unprecedented nature of the COVID-19 pandemic and the impacts of the non-pharmaceutical mitigation measures on peoples' sex lives and relationships, necessitated developing an ad-hoc coping questionnaire and attuning it to the pandemic's context. This was achieved by using available relevant literature (e.g., a comprehensive sexual motivations scale by Meston et al. [2020] and the study of sex, romance, and relationships among midlife and older adults by the American Association of Retired Persons/AARP [2010]), cognitive interviewing, and consultations with experts.

The questionnaire was pretested via 15 cognitive, think-aloud interviews (age range: 20–46 years old; gender: 9 women, 6 men). Cognitive interviewing with think-aloud protocols captured participant thought processes as they were engaging with the questions and allowed calibrating the focus of the measurement's assessment. This strategy helped identifying vague and complex questions (which required paraphrasing or deleting) and allowed establishing that the interviewees understand the questions correctly. The instrument was also content validated through the reviews of the panel of experts from sexuality studies and applied health sciences. These strategies helped find and resolve content- and order-related issues in the instrument and, consequently, contributed to its content validity.

The use and perceived usefulness of the coping mechanisms with the impacts of the pandemic on sex life were measured with 59 items covering the domains of pleasure, creativity, experimentation, diversion/distraction, goal-setting, relationships, communication, education, caution, logistics, substances, and technology. As indicated above, the pool of items (see Table 2 in the Results section) was created based on the literature review, consultations with experts, and cognitive interviewing. Participants were asked whether they have experienced each coping strategy during the pandemic (59 nominal, dichotomous [yes/no] variables) and requested to rate the degree of usefulness of that strategy on a 5-point scale where 1 = "extremely useless" and 5 = "extremely useful" (additional 59 usefulness ratings).

The control variables included relevant sociodemographic characteristics, perceived overall health, pandemic-induced stress, and adjustment to lockdown. The respondents shared information about their gender (nominal), age (ratio), the existence of a regular sex partner (nominal, dichotomous), and children living in the same household (ordinal). The participants rated their overall present health on a 5-point scale where 1 = "terrible" and 5 = "excellent." They also rated their average stress levels during the COVID-19 pandemic compared to the pre-pandemic stress levels using a 5-point scale where 1 = "much lower" and 5 = "much higher." Last, perceived adjustment to lockdown conditions was measured using a 5-point scale, where 1 = "extremely poorly" and 5 = "extremely well."

Statistical Analysis

The data were analyzed in IBM SPSS 27 software. The data met the parameters of normality (skew <|1|, kurtosis <|3|, and missing values < 5% on any variable). The missing values were treated with a full information maximum likelihood estimation method. To address RQ1 focusing on the dimensions of the coping mechanisms with the impacts of the COVID-19 pandemic on sex life, exploratory factor analysis (EFA) was conducted using the usefulness ratings (i.e., 5-point scale) to reduce items to their underlying factors. Exploratory analysis was chosen since the construct validity of the sexual coping mechanisms during the COVID-19 pandemic has not been established before. The criteria for assessing the factorability of the correlation matrix included item intercorrelations, Kaiser–Meyer–Olkin test of sample adequacy (KMO = 0.92), and Bartlett's test of sphericity (approx. $\chi^2 = 15{,}116.01$, $p < 0.001$). Based on these factorability criteria, the relationships in the data lend themselves well to factor analysis. The chosen extraction method was principal component analysis.

Oblique rotation was chosen, allowing factors to correlate since constraining the factors to orthogonality might contradict the exploratory nature of the analysis. Oblimin oblique rotation was chosen as it provided the cleanest solution. The following diagnostics guided the number of retained factors: eigenvalues > 1 (as a minimum based on the Kaiser criterion), a Scree plot, a minimum of three items per factor, simple structure principles, and conceptual interpretability of the factors. Factor loadings (λ) higher than 0.40 are presented in the model. The internal consistency coefficients of the factors were high (0.86 < Cronbach's α < 0.96). None of the items had to be eliminated due to low communalities or conflicts with simple structure principles (e.g., cross-loadings or insufficient loadings).

To answer RQ2 focusing on the differences in the perceived usefulness of the coping strategies between the people who have tried them and those who have not, a combination of the independent-samples *t*-tests and one-way analysis of variance (ANOVA) with post hoc testing was implemented. First, independent-samples *t*-tests were used to assess the differences at the individual item level. In these analyses, having used or not used a given strategy served as an independent variable, and the perceived usefulness of the coping strategy served as a dependent variable. Second, the comparisons were conducted at the aggregate level using ANOVA. Relying on the structure of the factors extracted in the EFA model (from RQ1), the sum indices were computed based on the use

Table 2 Exploratory factor analysis of the coping mechanisms with the impacts of the COVID-19 pandemic on sex life

			Factor Loadings (λ)								
Coping Strategies (59 strategies)[a]	*M*	*SD*	GSS	RES	RS	CLS	CIS	SCS	OTS	DS	ES
Goal-Setting Strategies (GSS; Eigenvalue = 24.48, Explained Variance = 41.5%, Cronbach's α = .93)											
I prioritize sex among other activities	3.05	0.94	0.46								
I have sex to feel desirable	3.29	0.98	0.60								
I have sex to feel satisfied	3.45	1.02	0.62								
I am being more aware of my sexual needs	3.44	1.03	0.75								
I concentrate my energy on sex	3.02	0.94	0.69								
I consider exactly what is important for me in sex	3.31	1.01	0.71								
I work on being content with my present sex life	3.37	1.01	0.73								
I focus on the quality of sex rather than its quantity	3.46	1.01	0.59								
I focus less on my physical sexual difficulties	3.17	0.96	0.68								
I do not let physical sexual difficulties affect how I feel about myself sexually	3.21	0.98	0.73								
Risk and Experimentation Strategies (RES; Eigenvalue = 6.69, Explained Variance = 11.3%, Cronbach's α = .96)											
I have tried new sex medicines, hormones, or treatments	2.71	0.94		0.64							
I have engaged in sexual role playing	2.84	0.97		0.59							
I have engaged in bondage and domination	2.96	1.05		0.47							
I have had sex with two partners—menage a trois	2.65	0.95		0.91							
I have had sex with multiple partners—orgy/group sex	2.59	0.91		0.91							
I have engaged in swinging/partner switching	2.59	0.93		0.88							
I have used the services of professional sex worker	2.60	0.91		0.85							
Relational Strategies (RS; Eigenvalue = 3.21, Explained Variance = 5.4%, Cronbach's α = .96)											
I have sex to express care for my partner	3.71	1.01			0.92						
I have sex to bond with my partner	3.76	1.02			0.88						
I have sex to support my partner emotionally	3.55	1.02			0.89						
I have sex to increase intimacy	3.69	1.01			0.85						
I focus on emotional closeness in sex	3.59	1.02			0.81						
I have sex to strengthen relationship	3.61	1.02			0.88						
I have sex to please my partner	3.63	1.05			0.85						
I am being more sensitive to my partner's sexual needs	3.58	1.05			0.79						
I am communicating openly about sex with my partner	3.64	1.11			0.40						
Caution and Logistical Strategies (CLS; Eigenvalue = 2.27, Explained Variance = 3.8%, Cronbach's α = .91)											
I have been making arrangements to have privacy for sex	3.21	0.99				0.60					
I have been scheduling sex	3.07	1.00				0.58					
I have been more careful with dating	3.11	1.01				0.78					
I have been more careful with choosing sexual partners	3.12	1.04				0.82					

Table 2 (continued)

Coping Strategies (59 strategies)[a]	*M*	*SD*	Factor Loadings (λ)								
			GSS	RES	RS	CLS	CIS	SCS	OTS	DS	ES
I have been more consistent with using sexual protection	3.22	1.01				0.70					
I have switched from partnered sex to self-stimulation/ masturbation	3.06	1.00				0.82					
Creativity and Innovation Strategies (CIS; Eigenvalue = 2.01, Explained Variance = 3.4%, Cronbach's α = .92)											
I have become more creative in sex	3.24	0.95					0.52				
I have become more playful in sex	3.25	0.95					0.43				
I use sex as a source of pleasure	3.58	1.00					0.49				
I am more spontaneous in sex	3.26	0.99					0.44				
I have fulfilled sexual fantasies that were suppressed before	3.14	1.07					0.55				
I have tried new sexual activities	3.42	1.1					0.69				
I have tried new sexual positions	3.41	1.12					0.69				
I have tried new sex aids/toys	3.25	1.16					0.57				
Substances and Context-Related Strategies (SCS; Eigenvalue = 1.65, Explained Variance = 2.8%, Cronbach's α = .89)											
I have had sex in a public place	2.85	0.96						0.61			
I have combined sex with alcohol	3.01	1.03						0.69			
I have combined sex with drugs	2.86	1.04						0.59			
Online and Technology Strategies (OTS; Eigenvalue = 1.34, Explained Variance = 2.3%, Cronbach's α = .89)											
I have watched porn alone	3.42	1.10							0.54		
I have watched porn with my partner	2.97	1.01							0.57		
I have exchanged erotic notes or emails	3.09	1.10							0.73		
I have taken erotic photos/videos	3.12	1.11							0.73		
I have had phone or webcam sex	2.93	1.06							0.68		
I have used geo-social networking applications (such as Tinder, Grindr) for dating	2.82	1.06							0.72		
Diversion Strategies (DS; Eigenvalue = 1.30, Explained Variance = 2.2%, Cronbach's α = .89)											
I view sex as leisure activity	3.31	0.98								0.40	
I use sex as a source of comfort	3.37	1.08								0.50	
I have sex to relax	3.45	1.09								0.63	
I have sex to relieve stress	3.49	1.10								0.55	
I use sex as a distraction from the pandemic	3.02	1.02								0.65	
I have sex to fill the extra time I have now	2.90	1.04								0.67	
I use sex to divert my anger and frustration	2.79	1.03								0.77	
Educational Strategies (ES; Eigenvalue = 1.21, Explained Variance = 2.1%, Cronbach's α = .86)											
I have spent time educating myself to enhance my sex life	3.23	1.12									0.40
I have attended a seminar/class to enhance my sex life	2.73	0.91									0.59
I have sought professional help for addressing my sexual difficulties	2.78	0.93									0.67

Table 2 (continued)

	Factor correlations (r)								
	GSS	RES	RS	CLS	CIS	SCS	OTS	DS	ES
GSS[b]	–								
RES	0.09	–							
RS	0.52	0.17	–						
CLS	0.34	0.33	0.40	–					
CIS	− 0.31	− 0.27	− 0.35	− 0.26	–				
SCS	0.03	0.27	0.04	0.12	− 0.03	–			
OTS	0.20	0.49	0.31	0.33	− 0.31	0.18	–		
DS	0.43	0.22	0.26	0.29	− 0.29	0. 13	0.24	–	
ES	− 0.27	− 0.22	− .25	− 0.19	0.12	− 0.13	− 0.24	− 0.17	–

[a]The EFA solution accounts for 74.9% of the total variance, KMO = .92, Bartlett's Test of Sphericity: $\chi^2(1, 711) = 15{,}116.01, p = .000$

[b]To interpret the indices: GSS—Goal-Setting Strategies, RES—Risk and Experimentation Strategies, RS—Relational Strategies, CLS—Caution and Logistical Strategies, CIS—Creativity and Innovation Strategies, SCS—Substances and Context-Related Strategies, OTS—Online and Technology Strategies, DS—Diversion Strategies, ES—Educational Strategies

items (to reflect the average use of the coping mechanisms), and the mean indices were calculated based on the perceived usefulness items (to reflect the average usefulness of the coping mechanisms).

The sum indices were further transformed to classify the sample into three groups of non-users, light(er) users, and heavy(er) users for each coping mechanism/index. Non-users were defined as the proportion of the participants in the sample who have not used any of the strategies in the given mechanism/index. A threshold of 50% of the number of activities within each mechanism/index was used to distinguish between the light(er) and heavy(er) users (i.e., below 50% = light(er) user and above 50% = heavy(er) user; while arbitrary, the threshold helps to illustrate the use patterns). It is important to note that this classification into three groups reflects the diversity of used strategies per participant within the coping mechanism/index rather than the frequency of use of the coping mechanisms. This grouping was used as an independent variable in ANOVA, while the usefulness mean indices were used as the dependent variables.

Finally, RQ3 (i.e., does the diversity of the tried strategies within each coping index predict the perceived usefulness of that index/coping mechanism?) was addressed using multiple regression (i.e., General Linear Model [GLM] Univariate Analysis in SPSS). In this analysis, the coping use sum indices (converted into *z* scores for interpretability and comparability) served as predictors/independent variables, and the coping usefulness mean indices served as the outcomes/dependent variables. The complete set of control variables included five sociodemographic variables (i.e., gender, availability of a regular sex partner, the existence of children, age, and perceived overall health) and three pandemic-related variables (i.e., changes in stress levels, adjustment to lockdown, and adjustment to social distancing). Control variables that had no significant effect were removed from the model. Appropriate effect sizes were computed throughout the analyses. Finally, the Bonferroni correction method was implemented to counteract the multiple comparisons problem (Sedgwick, 2014).

Results

Coping Mechanisms with the Impacts of the COVID-19 Pandemic on Sex Life

The EFA solution for the coping mechanisms with the impacts of the pandemic on sex life identified nine factors extracted from 59 items and accounting for 74.9% of the total variance (see Table 2). Based on the item content, the nine dimensions of coping—i.e., coping mechanisms—were interpreted as Goal-Setting Strategies (GSS; 10 items, Eigenvalue = 24.48, Explained Variance = 41.5%, Cronbach's

α = 0.93), Risk and Experimentation Strategies (RES; 7 items, Eigenvalue = 6.69, Explained Variance = 11.3%, Cronbach's α = 0.96), Relational Strategies (RS; 9 items, Eigenvalue = 3.21, Explained Variance = 5.4%, Cronbach's α = 0.96), Caution and Logistical Strategies (CLS; 6 items, Eigenvalue = 2.27, Explained Variance = 3.8%, Cronbach's α = 0.91), Creativity and Innovation strategies (CIS; 8 items, Eigenvalue = 2.01, Explained Variance = 3.4%, Cronbach's α = 0.92), Substances and Context-Related Strategies (SCS; 3 items, Eigenvalue = 1.65, Explained Variance = 2.8%, Cronbach's α = 0.89), Online and Technology Strategies (OTS; 6 items, Eigenvalue = 1.34, Explained Variance = 2.3%, Cronbach's α = 0.89), Diversion Strategies (DS; 7 items, Eigenvalue = 1.30, Explained Variance = 2.2%, Cronbach's α = 0.89), and Educational Strategies (ES; 3 items, Eigenvalue = 1.21, Explained Variance = 2.1%, Cronbach's α = 0.86).

The factor correlations ranged from weak to moderate and were both positive and negative ($-0.31 < r < 0.52$; Table 2). The factor of creativity and innovation strategies was negatively correlated with all the other factors, except for the factor of educational strategies. Likewise, the factor of educational strategies was negatively correlated with all the other factors, except for the factor of creativity and innovation strategies. The rest of the factor correlations were positive, with a notable/moderate correlations between the factors of relational strategies and goal-setting strategies ($r = 0.52$, $p = 0.001$), online and technology strategies and risk and experimentation strategies ($r = 0.49$, $p = 0.001$), diversion strategies and goal-setting strategies ($r = 0.43$, $p = 0.001$), caution and logistical strategies and relational strategies ($r = 0.39$, $p = 0.001$), and caution and logistical strategies and goal-setting strategies ($r = 0.34$, $p = 0.001$). To conclude, the EFA analysis has identified nine sexual coping mechanisms and some of them correlated with each other.

Differences in the Perceived Usefulness of the Coping Mechanisms Based on Experience

Table 3 presents the frequencies and proportions of the sample that have tried each coping strategy as well as the results of the independent-samples *t*-tests comparing the perceived usefulness of the coping strategies across the participants who have and have not tried the given strategy. Significant differences with very large effect sizes (given the guidance for interpreting Cohen's *d* effect sizes: 0.2—small, 0.5—medium, 0.8 or higher—large; Lakens, 2013) were found for each strategy out of the 59 tested coping strategies. Although all the effect sizes very large, the largest effect sizes were found among relational strategies and creativity and innovation strategies.

A series of ANOVA analyses were conducted to investigate further the differences in perceived usefulness by the levels of experience (see Table 4 and Fig. 1). To note some major patterns in the indices, Table 4 shows the highest average use of relational strategies (on average, 68.0% of the activities in the index were implemented by the participants, heavy(er) users—74.3%), goal-setting strategies (average implementation—49.8%, heavy(er) users—46.7%), creativity and innovation strategies (average implementation—45.5%, heavy(er) users—39.0%), and diversion strategies (average implementation—44.9%, heavy(er) users—48.6%). In turn, the highest usefulness was found for relational strategies ($M = 3.64$, $SD = 0.90$), creativity and innovation strategies ($M = 3.34$, $SD = 0.84$), goal-setting strategies ($M = 3.30$, $SD = 0.78$), and diversion strategies ($M = 3.22$, $SD = 0.85$). Risk and experimentation strategies (average implementation—8.4%, non-users—64.5%) and educational strategies (average implementation—18.7%, non-users—53.8%) were among the least utilized and the least useful mechanisms ($M = 2.83$, $SD = 0.95$; $M = 3.01$, $SD = 0.96$, respectively). Substances and context-related strategies were among the least useful mechanisms ($M = 2.96$, $SD = 0.94$), but their use patterns had high variability (heavy(er) users—26.4%, non-users—56.0%).

The results of ANOVA with the aggregate usefulness indices (dependent variables) and three user groups (independent variables) revealed significant differences and very large effects (for interpreting the eta squared (η^2) effect sizes: 0.01—small, 0.06—medium, 0.14 or higher—large) in all the coping mechanisms: goal-setting strategies ($F(4, 414) = 59.57$, $p < 0.001$, $\eta^2 = 0.22$), risk and experimentation strategies ($F(2, 341) = 31.139$, $p < 0.001$, $\eta^2 = 0.15$), relational strategies ($F(2, 410) = 80.88$, $p < 0.001$, $\eta^2 = 0.28$), caution and logistical strategies ($F(2, 387) = 34.60$, $p < 0.001$, $\eta^2 = 0.15$), creativity and innovation strategies ($F(2, 415) = 107.94$, $p < 0.001$, $\eta^2 = 0.34$), substances and context-related strategies ($F(2, 360) = 35.64$, $p < 0.001$, $\eta^2 = 0.17$), online and technology strategies ($F(2, 387) = 40.11$, $p < 0.001$, $\eta^2 = 0.17$), diversion strategies ($F(2, 414) = 80.36$, $p < 0.001$, $\eta^2 = 0.28$), and educational strategies ($F(2, 391) = 51.88$, $p < 0.001$, $\eta^2 = 0.21$). Figure 1 shows significant differences among all three groups on each coping mechanism, with light(er) users having significantly higher usefulness scores that non-users and heavy(er) users having significantly higher scores than both light(er) users and non-users. To conclude, people who tried any given sexual coping strategy viewed it as significantly more useful than people who have not tried it, and this pattern was very consistent both at the item level and factor level of the analysis.

Diversity of Used Strategies Within the Coping Mechanism as a Predictor of Its Usefulness

A series of multivariate regressions were calculated (see Table 5) to predict the perceived usefulness of the coping

Table 3 Use and usefulness of the coping strategies with the impacts of the COVID-19 pandemic on sex life

Coping Strategies (59 strategies)	Use		Usefulness			
			Independent-Sample *t*-test			
			Used	Not Used		Cohen's
	n	%	*M*	*M*	*t*	*d*[a]
Goal-setting strategies						
I prioritize sex among other activities	109	26.0	3.77	2.78	9.80****	1.19
I have sex to feel desirable	215	51.2	3.73	2.79	10.96****	1.09
I have sex to feel satisfied	238	67.4	3.79	2.71	11.58****	1.23
I am being more aware of my sexual needs	255	60.7	3.82	2.81	11.41****	1.11
I concentrate my energy on sex	100	23.8	3.68	2.79	8.01****	1.03
I consider exactly what is important for me in sex	218	51.9	3.77	2.78	11.48****	1.13
I work on being content with my present sex life	256	61.0	3.74	2.73	11.08****	1.13
I focus on the quality of sex rather than its quantity	281	66.9	3.79	2.72	11.99****	1.21
I focus less on my physical sexual difficulties	170	40.5	3.68	2.78	10.24****	1.06
I do not let physical sexual difficulties affect how I feel about myself sexually	204	48.6	3.66	2.72	10.86****	1.09
Risk and experimentation strategies						
I have tried new sex medicines, hormones, or treatments	22	5.2	4.00	2.62	6.85****	1.59
I have engaged in sexual role playing	71	16.9	3.76	2.61	9.79****	1.35
I have engaged in bondage and domination	97	23.1	3.92	2.59	12.67****	1.55
I have had sex with two partners—ménage a trois	24	5.7	3.73	2.57	5.80****	1.28
I have had sex with multiple partners—orgy/group sex	11	2.6	3.55	2.55	3.60****	1.11
I have engaged in swinging/partner switching	15	3.6	3.60	2.54	4.44****	1.18
I have used the services of professional sex worker	9	2.1	3.88	2.56	4.12****	1.48
Relational strategies						
I have sex to express care for my partner	297	70.7	4.05	2.79	13.39****	1.50
I have sex to bond with my partner	313	74.5	4.07	2.76	12.17****	1.53
I have sex to support my partner emotionally	248	59.0	4.00	2.81	14.27****	1.43
I have sex to increase intimacy	318	75.7	4.02	2.58	14.07****	1.67
I focus on emotional closeness in sex	274	65.2	3.99	2.75	13.64****	1.47
I have sex to strengthen relationship	270	64.3	4.01	2.78	13.61****	1.46
I have sex to please my partner	302	71.9	3.93	2.75	11.81****	1.29
I am being more sensitive to my partner's sexual needs	265	63.1	4.01	2.78	14.14****	1.42
I am communicating openly about sex with my partner	284	67.6	4.03	2.72	12.86****	1.40
Caution and logistical strategies						
I have been making arrangements to have privacy for sex	163	38.8	3.78	2.78	10.65****	1.16
I have been scheduling sex	112	26.7	3.77	2.76	9.11****	1.15
I have been more careful with dating	129	30.7	3.74	2.75	9.40****	1.11
I have been more careful with choosing sexual partners	118	28.1	3.87	2.72	10.90****	1.30
I have been more consistent with using sexual protection	138	32.9	3.82	2.82	9.92****	1.12
I have switched from partnered sex to self-stimulation/masturbation	90	21.4	3.89	2.75	9.83****	1.31
Creativity and innovation strategies						
I have become more creative in sex	171	40.7	3.83	2.82	12.19****	1.26
I have become more playful in sex	171	40.7	3.89	2.78	14.31****	1.45
I use sex as a source of pleasure	327	77.9	3.84	2.64	11.47****	1.37
I am more spontaneous in sex	191	45.5	3.84	2.76	12.96****	1.29
I have fulfilled sexual fantasies that were suppressed	112	26.7	4.07	2.69	13.83****	1.62
I have tried new sexual activities	201	47.9	4.04	2.67	14.80****	1.59
I have tried new sexual positions	218	51.9	3.97	2.62	13.74****	1.49
I have tried new sex aids/toys	137	32.6	4.14	2.67	14.51****	1.60

Table 3 (continued)

Coping Strategies (59 strategies organized under 8 categories)	Use		Usefulness			
			Independent-Sample *t*-test			
			Used	Not Used		Cohen's
	n	%	*M*	*M*	*t*	*d*[a]
Substances and context-related strategies						
I have had sex in a public place	72	17.1	3.43	2.70	5.99****	0.81
I have combined sex with alcohol	164	39.0	3.50	2.62	8.93****	0.95
I have combined sex with drugs	91	21.7	3.60	2.60	8.53****	1.05
Online and technology strategies						
I have watched porn alone	276	65.7	3.74	2.62	11.22****	1.14
I have watched porn with my partner	95	22.6	3.72	2.70	8.65****	1.13
I have exchanged erotic notes or emails	126	30.0	3.96	2.62	13.17****	1.48
I have taken erotic photos/videos	158	37.6	3.84	2.57	13.00****	1.39
I have had phone or webcam sex	72	17.1	3.99	2.64	11.07****	1.48
I have used geo-social networking applications (such as Tinder, Grindr) for dating	101	24.0	3.46	2.54	6.90****	0.94
Diversion strategies						
I view sex as leisure activity	256	61.0	3.70	2.68	11.74****	1.20
I use sex as a source of comfort	232	55.2	3.94	2.62	15.19****	1.52
I have sex to relax	260	61.9	3.90	2.67	13.15****	1.35
I have sex to relieve stress	267	63.6	3.97	2.60	14.98****	1.55
I use sex as a distraction from the pandemic	124	29.5	3.89	2.62	13.94****	1.51
I have sex to fill the extra time I have now	100	23.8	3.91	2.55	13.61****	1.58
I use sex to divert my anger and frustration	79	18.8	3.79	2.54	9.21****	1.40
Educational strategies						
I have spent time educating myself to enhance my sex life	180	42.9	3.96	2.62	14.78****	1.50
I have attended a seminar/class to enhance my sex life	23	5.5	3.82	2.66	6.08****	1.34
I have sought professional help for addressing my sexual difficulties	33	7.9	3.70	2.69	6.26****	1.14

[a] For interpreting Cohen's *d* effect sizes: .2—small, .5—medium, .8 or higher—large (Lakens, 2013)

****$p < .001$

mechanisms based on the participants' use patterns of the corresponding mechanisms (standardized into *Z* scores) while controlling for the sociodemographic and pandemic-related variables. Control variables that had no significant effect were removed from the model. The results showed positive effects and very large effect sizes for the capacity of the coping mechanism's degree of use to predict its perceived usefulness (for interpreting the partial eta-squared (η_p^2) effect sizes: 0.01—small, 0.06—medium, 0.14 or higher—large).

The usefulness of the goal-setting strategies was significantly predicted by the degree of use of this coping mechanism ($B = 0.37$, $SE = 0.04$, $t = 10.80$, $p < 0.001$, $\eta_p^2 = 0.23$) and age ($B = -0.01$, $SE = 0.00$, $t = -2.56$, $p < 0.01$, $\eta_p^2 = 0.02$; lower predicted scores with advanced age), with these variables explaining 30% of variability ($R^2 = 0.30$). The usefulness of the risk and experimentation strategies was significantly predicted by the degree of use of this coping mechanism ($B = 0.32$, $SE = 0.05$, $t = 7.09$, $p < 0.001$, $\eta_p^2 = 0.14$), having children ($B = -0.27$, $SE = 0.13$, $t = -2.14$, $p < 0.05$, $\eta_p^2 = 0.01$; people with children having higher predicted usefulness scores), and overall health ($B = -0.13$, $SE = 0.06$, $t = -2.12$, $p < 0.05$, $\eta_p^2 = 0.01$; people with better health having lower predicted scores), with these variables explaining 18% of variability ($R^2 = 0.18$). The usefulness of the relational strategies was significantly predicted by the degree of use of this coping mechanism ($B = 0.55$, $SE = 0.04$, $t = 12.64$, $p < 0.001$, $\eta_p^2 = 0.29$) and age ($B = -0.01$, $SE = 0.003$, $t = -2.41$, $p < 0.05$, $\eta_p^2 = 0.02$), with these variables explaining 39% of variability ($R^2 = 0.39$).

The usefulness of the caution and logistical strategies was significantly predicted only by the degree of use of this

Table 4 Coping indices, groups of users, and differences in perceived usefulness of the coping mechanisms among user groups

Index[a]	Use							Usefulness[f]		ANOVA		
	Items in Index	Σ Index Average Use[b]			Non- Users[d]	Light(er) Users[e]	Heavy(er) Users[e]					
	No.	*M*	*M(%)*[c]	*SD*	%	%	%	*M*	*SD*	*F*	*p*	η^{2g}
Goal-setting strategies	10	4.98	49.8	2.82	11.9	41.4	46.7	3.30	0.78	59.57	****	0.22
Risk and experimentation strategies	7	0.59	8.4	1.02	64.5	33.1	2.4	2.83	0.95	31.14	****	0.15
Relational strategies	9	6.12	68.0	3.25	14.3	11.4	74.3	3.64	0.9	80.88	****	0.28
Caution and logistical strategies	6	1.79	29.8	1.68	31.2	51.7	17.1	3.19	0.87	34.60	****	0.15
Creativity and innovation strategies	8	3.64	45.5	2.51	13.1	47.9	39.0	3.34	0.84	107.94	****	0.34
Substances and context-related strategies	3	0.78	26.0	1.00	56.0	17.6	26.4	2.96	0.94	35.64	****	0.17
Online and technology strategies	6	1.97	32.8	1.62	20.2	60.5	19.3	3.16	0.91	40.11	****	0.17
Diversion strategies	7	3.14	44.9	2.06	15.7	35.7	48.6	3.22	0.85	80.36	****	0.28
Educational strategies	3	0.56	18.7	0.69	53.8	37.9	8.3	3.01	0.96	51.88	****	0.21

[a]The items in each coping category were summed to create a Sum (Σ) Index

[b]The average number of strategies used by the participants in each index and their standard deviations

[c]To facilitate the comparison of the use patterns across the indices, the Sum Index (i.e., Σ Index Average Use) was converted into percentages (%)

[d]Proportion of the participants in the sample who have not used any of the strategies in the given category

[e]A threshold of 50% of the number of activities within each category/index was used to distinguish between the light(er) and heavy(er) users (i.e., below 50% = light(er) user; above 50% = heavy(er) user; while arbitrary, the threshold helps to illustrate the use patterns). These figures represent the diversity of use per participant within the category, rather than the frequency of use

[f]Representing mean scores of the factors from the EFA solution presented in Table 2

[g]For interpreting the eta squared (η^2) effect sizes in ANOVA: $\eta^2 = .01$ indicates a small effect; $\eta^2 = .06$ indicates a medium effect; $\eta^2 = .14$ indicates a large effect (Lakens, 2013)

****$p < .001$

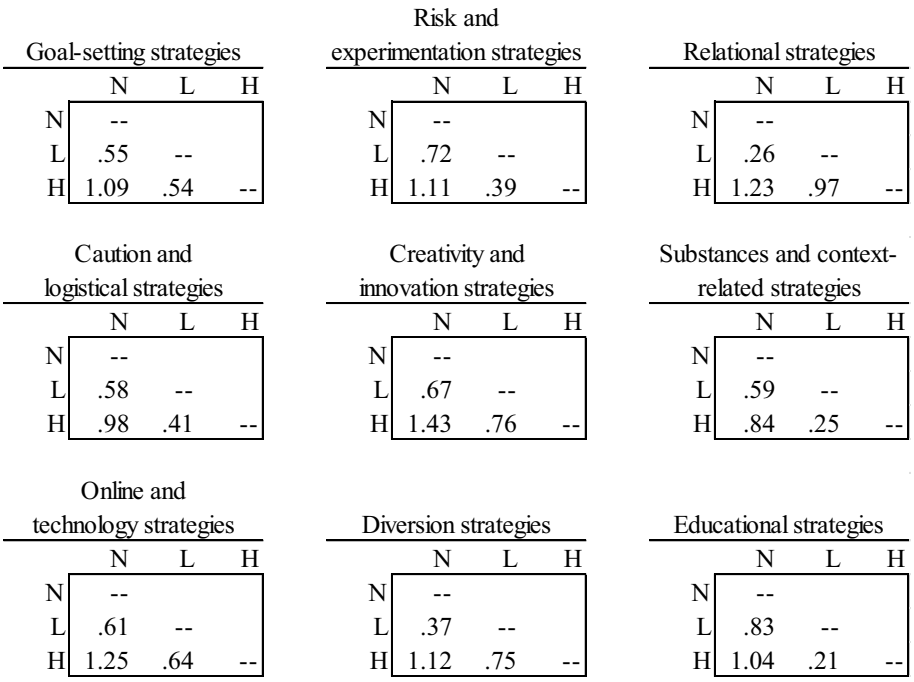

Fig. 1 Results of the post-hoc tests for the coping indices and their usefulness. Note. N = non-users, L = light(er) users, H = heavy(er) users. The numbers represent mean differences that are significant at the p < .001 level. To avoid duplications, mean differences are presented when a cluster on the horizontal axis has a higher mean than a cluster on the vertical axis

coping mechanism ($B = 0.39$, $SE = 0.041$, $t = 9.50$, $p < 0.001$, $\eta_p^2 = 0.20$), which explained 22% of variability ($R^2 = 0.22$). The usefulness of the creativity and innovation strategies was significantly predicted by the degree of use of this coping mechanism ($B = 0.53$, $SE = 0.04$, $t = 14.99$, $p < 0.001$, $\eta_p^2 = 0.35$) and gender ($B = -0.17$, $SE = 0.07$, $t = -2.26$, $p < 0.05$, $\eta_p^2 = 0.01$; with women having higher predicted usefulness scores), with these variables explaining 41% of variability ($R^2 = 0.41$). The usefulness of the substances and context-related strategies was significantly predicted only by the degree of use of this coping mechanism ($B = 0.38$, $SE = 0.05$, $t = 8.30$, $p < 0.001$, $\eta_p^2 = 0.17$), which explained 18% of variability ($R^2 = 0.18$).

The usefulness of the online and technology strategies was significantly predicted by the degree of use of this coping mechanism ($B = 0.43$, $SE = 0.04$, $t = 9.96$, $p < 0.001$, $\eta_p^2 = 0.21$) and gender ($B = -0.31$, $SE = 0.09$, $t = -3.32$, $p < 0.001$, $\eta_p^2 = 0.03$; with women having higher predicted usefulness scores), with these variables explaining 26% of variability ($R^2 = 0.26$). The usefulness of the diversion strategies was significantly predicted by the degree of use of this coping mechanism ($B = 0.49$, $SE = 0.03$, $t = 14.36$, $p < 0.001$, $\eta_p^2 = 0.34$), gender ($B = -0.15$, $SE = 0.08$, $t = -2.03$, $p < 0.05$, $\eta_p^2 = 0.01$), age ($B = -0.01$, $SE = 0.00$, $t = -2.61$, $p < 0.01$, $\eta_p^2 = 0.02$) and adjustment to lockdown ($B = 0.09$, $SE = 0.04$, $t = 2.11$, $p < 0.05$, $\eta_p^2 = 0.01$), with these variables explaining 39% of variability ($R^2 = 0.39$). Finally, the usefulness of the educational strategies was significantly predicted only by the degree of use of this coping mechanism ($B = 0.38$, $SE = 0.04$, $t = 8.52$, $p < 0.001$, $\eta_p^2 = 0.16$), which explained 20% of variability ($R^2 = 0.20$). To conclude, the results show that the diversity of the tried strategies within each coping mechanism predicts the perceived usefulness of the given coping mechanism as a whole.

Discussion

Despite the effect of sexual activity on health and quality of life (Berdychevsky & Carr, 2020; Hensel et al., 2020; Jacob et al., 2020), insufficient research attention has been focused on maintaining sexual health and related coping mechanisms during the pandemic (Giami, 2021; Pennanen-Iire et al., 2021). This exploratory study's results on the coping mechanisms' scope of use and perceived effectiveness during the pandemic offer valuable insights to start addressing this gap. Specifically, this study reveals nine coping mechanisms, including goal-setting strategies, risk and experimentation strategies, relational strategies, caution and logistical strategies, creativity and innovation strategies, substances and context-related strategies, online and technology strategies, diversion strategies, and educational strategies. Consistently, across all the specific coping strategies and overall coping mechanisms, people who tried them found them significantly more useful than those who had not. Moreover, a higher diversity of tried strategies per coping mechanism consistently and significantly predicted the perceived usefulness of that coping mechanism. Therefore, it is important to promote experiential coping and future work should use the sexual coping scale developed in this study to assess whether this scale is associated with enhanced mental health and sexual well-being.

Table 5 Coping use indices as predictors of the perceived usefulness of the coping mechanisms

Perceived Usefulness (outcomes)		Corresponding use index (Σ index converted to *Z* score; predictors)	Control Variables[a]					R^{2c}	*Adj.* R^2
			Gender	Age	Children	Health	Adj. to lockdown		
Goal-setting strategies								**.30**	**.28**
	F	116.58****	–	6.54**	–	–	–		
	B	.37	–	− .01	–	–	–		
	t	10.80****	–	− 2.56**	–	–	–		
	$\eta_p^{2\,b}$	.23	–	.02	–	–	–		
Risk and experimentation strategies								**.18**	**.16**
	F	50.31****	–	–	4.58*	4.47*	–		
	B	.32	–	–	-.27	-.13	–		
	t	7.09****	–	–	-2.14*	-2.12*	–		
	η_p^2	.14	–	–	.01	.01	–		
Relational strategies								**.39**	**.38**
	F	159.67****	–	5.81*	–	–	–		
	B	.55	–	− .01	–	–	–		
	t	12.64****	–	− 2.41*	–	–	–		
	η_p^2	.29	–	.02	–	–	–		
Caution and logistical strategies								**.22**	**.20**
	F	90.23****	–	–	–	–	–		
	B	.39	–	–	–	–	–		
	t	9.50****	–	–	–	–	–		
	η_p^2	.20	–	–	–	–	–		
Creativity and innovation strategies								**.41**	**.39**
	F	215.67****	5.09*	–	–	–	–		
	B	.53	− .17	–	–	–	–		
	t	14.99****	− 2.26*	–	–	–	–		
	η_p^2	.35	.01	–	–	–	–		
Substances and context-related strategies								**.18**	**.16**
	F	68.80****	–	–	–	–	–		
	B	.38	–	–	–	–	–		
	t	8.30****	–	–	–	–	–		
	η_p^2	.17	–	–	–	–	–		
Online and technology strategies								**.26**	**.24**
	F	99.26****	11.05****	–	–	–	–		
	B	.43	− .31	–	–	–	–		
	t	9.96****	− 3.32****	–	–	–	–		
	η_p^2	.21	.03	–	–	–	–		
Diversion strategies								**.39**	**.38**
	F	206.18****	4.13*	6.81**	–	–	4.46*		
	B	.49	− .15	− .01	–	–	.09		
	t	14.36****	− 2.03*	− 2.61**	–	–	2.11*		
	η_p^2	.34	.01	.02	–	–	.01		
Educational strategies								**.20**	**.19**
	F	72.53****	–	–	–	–	–		
	B	.38	–	–	–	–	–		
	t	8.52****	–	–	–	–	–		
	η_p^2	.16	–	–	–	–	–		

[a]The complete set of control variables included five sociodemographic variables (i.e., gender, regular sex partner, children, age, and overall health) and three pandemic-related variables (i.e., changes in stress levels, adjustment to lockdown, and adjustment to social distancing); control variables that had no significant effects are not presented

[b]For interpreting the partial eta-squared (η_p^2) effect sizes: .01—small, .06—medium, .14 or higher—large (Lakens, 2013)

[c]R^2 and adjusted R^2 (the values in bold) are reported for each outcome/dependent variable in the model; R^2 reflects the predicted % of variability in the dependent variable

****$p < .001$; ***$p < .005$; **$p < .01$; *$p < .05$; – not significant

It is likely that successful sexual coping leads to resilience and paves the way for additional coping, establishing a beneficial coping cycle. Sexual health scholars and practitioners should find ways to launch and maintain this tendency because coping contributes to person's capacity to overcome adversity, and it characterizes people who show healthy psychological development and grow more resilient as a result of navigating adverse events (Coronado et al., 2021). Furthermore, sexual coping during the pandemic is crucial because it contributes to better mental health outcomes and a sense of connectedness and serves as a protective factor against pandemic-related stress, anxiety, depression, and other adverse impacts (Maretti et al., 2020; Mollaioli et al., 2021; Rosenberg et al., 2021). Sexual expression and positive coping are vital to resilience and psychological well-being (Berdychevsky et al., 2021; Pennanen-Iire et al., 2021).

On average, relational strategies and goal-setting strategies were more commonly used and rated as more effective than other strategies. Research shows that the coping mechanisms with fear and threat involve relationship processes (Plusnin et al., 2018; Rodrigues & Lehmiller, 2022). Nevertheless, spending more time together during the COVID-19 pandemic might mean coexisting rather than coping and having more quality time together (O'Reilly Treter et al., 2021; Pereira Lopes et al., 2020). In turn, forced prolonged cohabitation negatively affects both dyadic and autoerotic sexuality, which are essential for sexual well-being (Panzeri et al., 2020). However, aligning with this study's results on the importance of relational and goal-setting coping, relationship variables, such as effective communication and ability to navigate conflict, were found as the key factors in coping with the impacts of the pandemic on sex life (Balzarini et al., 2020; Luetke et al., 2020; Pascoal et al., 2021; Pereira Lopes et al., 2020).

Although there is no universal desirable sexual script, this exploratory study shows that people in a healthy relationship could use the disruption of their routine to strengthen their relationship by broadening their sexual script, initiating open sex-related communication, thinking outside the box, introducing an element of novelty, (re)defining sex as more than penetration, allocating protected time for sex, and focusing on sexual play and pleasure instead of duty (Dewitte et al., 2020; Goss et al., 2022). At least for some couples, the lockdown conditions decreased their social isolation from each other, which increased their sexual arousal and activity (Micelli et al., 2020; Mumm et al., 2021). "When the state of alert is over, a lot of work will have to be done, especially on the couple, to return to normal" (Ibarra et al., 2020, p. 105), and this study offers valuable insights concerning relational coping tools that could contribute to this process.

Relational and goal-setting coping strategies were followed by creativity and innovation strategies and diversion strategies in terms of their use and perceived utility. Even pre-pandemic studies showed that sexual novelty and propensity to experiment were inversely correlated with sexual monotony and boredom (Matthews et al., 2018). Conversely, unwillingness or inability to innovate in sex life were positively correlated with sexual boredom (Rosa et al., 2019). Sexual boredom has been conceptualized as sexual monotony leading to a lack of sexual interest and detrimental effects on relationships (de Oliveira et al., 2021). In the shadow of the pandemic, many couples were faced with stress, boredom, monotony, and a desperate need for distraction.

Some couples might not have had the resilience and tools to prevent pandemic-induced boredom from spilling over into sexual boredom, which has negatively affected their sexual function and satisfaction (de Oliveira & Carvalho, 2021). Nevertheless, as this study shows, other people reacted to this threat of boredom by innovating, experimenting, fantasizing, and expanding their sexual repertoires (Cabello et al., 2020; Cascalheira et al., 2021; Eleuteri & Terzitta, 2021). Moreover, it was found that such sexual self-expansion contributed to sexual desire, sense of novelty, and relational closeness (Goss et al., 2022). Also, people who experimented with their sexual repertoires during the pandemic were three times more likely to report improvements in their sex lives compared to those who do not (Lehmiller et al., 2020).

Online and technology coping strategies followed the creativity and innovation strategies in terms of their use and perceived utility. When the opportunities for in-person, partnered sex are limited, various solo and online activities can be used to fill this void, which prompted substantial increases in pornography searches, dating app downloads, and sex toys sales at the break of the pandemic (Döring, 2020; Lehmiller et al., 2020; Mestre-Bach et al., 2020; Rolleri Insignares et al., 2021). While some of this technology might be more relevant to single people (e.g., dating apps), other kinds of sextech could be used to cope and enhance sex life by both partnered and non-partnered people. Specifically, a Portuguese study of online pornography use during the pandemic found that single people who increased their pornography use had better perceived health and sleep quality while partnered people who increased their joint (i.e., with a partner) pornography use reported an increased sex life quality (Rodrigues, 2021). Aligning with this study's results, researchers proposed that online pornography use can serve as a strategy to cope with stress and meet people's sexual needs (Gillespie et al., 2021; Grubbs et al., 2022; Hille et al., 2021; Rodrigues, 2021).

Overall, the accelerated implementation of technology in sex life during the pandemic "could permanently shift the way we approach sex, currently and long after the pandemic subsides" (Lehmiller et al., 2020, p. 2). Notably, the new(er) virtual forms of sexual activity will not necessarily bring optimal satisfaction and sexual well-being to all people who will venture out into these novel areas during the pandemic and its aftermath (Lehmiller et al., 2020; Mercer et al., 2022;

Rosenberg et al., 2021). In this context, the capacity for creativity, adaptation, and renewal of sexual scripts and scenarios will be decisive (Giami, 2021), which links this discussion back to the importance of creativity and innovation coping mechanisms.

Caution and logistical coping strategies followed online and technology strategies in terms of their use and perceived utility. Some of the challenges that couples were facing during the lockdowns included pandemic-induced stress, conflict, poor communication, diminished personal space and alone time, and decreased quality time together (Luetke et al., 2020; O'Reilly Tretter et al., 2021; Pereira Lopes et al., 2020). Also, the closure of schools/daycare services and their move to online environment created a challenging situation for many parents, leading to diminished sexual desire and function (Ibarra et al., 2020; Schiavi et al., 2020). Nevertheless, this study shows that some couples found ways to cope with these circumstances by scheduling and making arrangements to have privacy for sex. In turn, singles and non-cohabitating couples faced isolation and separation during the lockdown and had to choose between in-person sexual expression and non-compliance to physical distancing measures. This study shows that people coped with this choice by either exercising additional caution (in terms of dating, partner choice, and protection) or switching from partnered sex to self-stimulation.

Substances and context-related strategies followed caution and logistical coping strategies based on their use, but their usefulness was rated as among the lower in the sample. This might suggest that this was one of the less beneficial and (for some people) possibly even maladaptive coping mechanisms. However, again, people who used these strategies found them more useful than those who have not. In line with these exploratory results, some studies found that alcohol consumption was one of the contributing factors to sexual activity during the time of self-isolation/self-distancing (Jacob et al., 2020; López-Bueno et al., 2021). Conversely, other studies showed that alcohol consumption during the COVID-19 pandemic was associated with worsening sexual function (Karsiyakali et al., 2021). These equivocal tendencies concerning the roles of substances in sexual coping in the pandemic's shadow warrant further investigation, particularly with a focus on the adaptive and maladaptive coping capacity.

Educational strategies followed the substances and context-related strategies with modest use and perceived usefulness rating. Periods of lockdowns and physical confinement offer both single and partnered people opportunities to combine education, practice, and treatment to recover/enhance their sexual self-esteem, self-knowledge, and confidence in sexual performance (Kirana & Tripodi, 2020). COVID-19 stay-at-home orders have not been easy to navigate for many people yet, for some, it was an opportunity to reflect and reappraise their sex lives and learn more about sex through the internet-based platforms and telemedicine/e-Health, including podcasts, documentaries, and educational materials (de Oliveira & Cravalho, 2021; Döring, 2020; Eleuteri & Terzitta, 2021; Rolleri Insignares et al., 2021). However, given a modest use of this coping strategy in this exploratory study, only motivated people are likely to find home confinement as an occasion to pursue the more committing educational options and comply with the schedule of the sexual therapy exercises and regular educational seminars (Pennanen-Iire et al., 2021).

Finally, risk and experimentation strategies were least commonly used and rated as least useful. In some sense, this might seem counterintuitive because, at least for some people, these strategies could be a part of creativity and innovation coping mechanism that was both highly used and viewed as useful. Nevertheless, it is possible that the items included in the risk and experimentation domain of the questionnaire were either too risqué for the participants in this study or more heavily affected by the quarantine and social distancing restrictions. However, like with all the other coping mechanisms examined in this study, people who used risk and experimentation strategies found them more useful than those who have not. Moreover, sexual innovations implemented as coping mechanisms during the pandemic might also constitute the beginnings of new lifestyles and novel forms of sex life in terms of techniques, practices, relationship modes, and even an evolution of sex morality (e.g., normalization of some sexual practices and lifestyles, new forms of fidelity or cyber-fidelity; Giami, 2021; Witt, 2016).

Conclusions and Implications for Practice, Education, and Policy

This exploratory study was conducted under unique historical circumstances and offers valuable insights into the coping mechanisms that people employed to navigate the impacts of the COVID-19 pandemic on their sex lives. Despite the study's contributions, the results should be interpreted with caution due to the use of web-based data collection, nonprobability sampling, cross-sectional design, and the exploratory nature of this study. Face-to-face methodologies could have contributed different or supplemental insights. However, they would have been unfeasible during the lockdowns. In addition, tech-based data collection tools might create a bias in behavioral data (Hille et al., 2021), meaning that data collection in a virtual environment might attract participants who generally have higher acceptance of technology. Given the cross-sectional nature of this study, the results reflect the scope of use and the perceived utility of the coping mechanisms at a particular point in time but cannot show the evolution in the roles of these mechanisms over the course of the pandemic, or over time more generally.

Also, arbitrary cut-off values were used to define each coping index's high, medium, and low use. However, creating groups was essential for capturing the diversity of coping. Further validation of the developed scale is also required, including the collection of additional data to run a confirmatory factor analysis and other forms of structural equation modeling to test the relationships that were suggested in this exploratory study before they can be used to inform clinical practice. Finally, this study's sample is predominantly heterosexual and white/Caucasian, and this homogeneity precludes comparisons and limits generalizations. Future studies could address these limitations by utilizing various methodologies, studying different populations, adopting a longitudinal approach, and probing deeper into the complexity of sexual coping in the shadow of the public health crisis. Furthermore, future research should assess whether asking people to adopt these sexual coping mechanisms can promote better sexual health and well-being during the times of crises.

Despite limitations, this study's results make a novel and important contribution to literature and could potentially contribute to practice by improving our understanding of the coping mechanisms enhancing sexual resilience in the shadow of the pandemic. These exploratory findings show that amidst COVID-related adversity and challenges, many people found ways to adapt their sex lives and enjoy silver-lining opportunities to expand their sexual repertoires and enhance satisfaction. Upon further investigation, this essential information can inform sexual health scholars and professionals in various areas of sex and family therapy and education to develop strategies and programs that help patients flourish in their sex lives and relationships in general and during the public health crises.

This study's results about coping mechanisms and their effectiveness offer promising evidence that could be further investigated to offer actionable strategies to sex clinicians and educators to adapt their praxis and interventions to best serve their clients' needs. Specifically, the assessment of sexual activities and coping strategies during the pandemic and its aftermath may benefit patients because some patients may be unaware of helpful strategies, while others might struggle with inhibitions and shame preventing them from trying or benefiting from helpful coping strategies. Hence, increasing awareness of the potentially helpful strategies showcased in this study and implementing motivational interviewing and targeted psychoeducation to normalize sexual coping strategies and alleviate the emotional distress from sexual experimentation could contribute to the sexual health and well-being of many people.

The pandemic's impacts on sexual resilience, well-being, and coping must also be considered by policymakers when contemplating future lockdowns and physical distancing measures (Mercer et al., 2022; Wignall et al., 2021). Moreover, sexual health education should be a priority during the public health crises (Panzeri et al., 2020; Rolleri Insignares et al., 2021). It is essential to provide targeted and tailored sexual health services to help people cope with the impacts of the pandemic on their sex lives and relationships to minimize personal and family suffering (Döring, 2020; Jacob et al., 2020; Sonnenberg et al., 2022). Such education should incorporate COVID-19's impacts on sexual health as well as resilience-building, adaptations, and enhancing coping skills during the pandemic (Berdychevsky et al., 2021).

To conclude, this comprehensive exploratory study offers meaningful insights into the coping strategies that people used to mitigate the impacts of the COVID-19 pandemic and related prevention measures on their sex lives. The results of this study emphasize the importance and complexity of these coping mechanisms. This knowledge is essential because it has a potential to help sexual health researchers, educators, clinicians, and the broader public appreciate the importance and intricacy of sexuality and the mechanisms of coping during times of public health crises, adequately assess barriers to the desired sexual experiences, and contribute to the design of the tailored solutions to people's sexual challenges (Hensel et al., 2020). Last, we must use the lessons learned from this pandemic to address the ongoing and future public health crises.

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Declarations

Conflict of interest The author reports that there are no competing interests to declare.

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