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ORIGINIAL ARTICLE

Effects of COVID-19 on sexual life — a meta-analysis

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Summary
Context. — Starting with the end of 2019, humanity is fighting a new type of virus, SARS-COV-2, which has brought great changes in people’s lives. The COVID-19 pandemic began at the end of 2019 and spread rapidly around the world, affecting the entire planet population.

Methods. — In order to identify the studies on the topic for this meta-analysis, we performed an exclusively electronic search in the international databases for specialized literature: Google Scholar and ProQuest and other sources of specialty literature; and as a result of these searches, based on keywords, we found a number of 64 articles. The key words for this search were: pandemic, COVID-19, sexual life, sexual behavior, satisfaction, marital status, Coronavirus disease. Are represented by major conditions that stand at the basis of sexual disorders and of the sexual quality life during the COVID-19 period.

Results. — Of the 64 articles resulting from the database search, 7 met the criteria for inclusion in the study. Of the remaining 7 studies, 3 were conducted in the United States, one in China, one in Turkey, one in Italy and one in the United Kingdom of Great Britain and Northern Ireland. Most studies were conducted between March and April 2020 including a total of 6929 participants.

Conclusion. — The results showed there was a decrease in sexual activity during the period included in the analysis, which indicates the impact on the quality of sex life in individuals.

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Introduction

Since the end of 2019, humanity has been facing a new type of virus, SARS-CoV-2, which has greatly affected all people’s lives. The COVID-19 pandemic began in late 2019 and spread rapidly around the world, affecting the entire population of the planet, being first documented in China, in December 2019 according to World Health Organization (2020c, "WHO announces COVID-19 outbreak a pandemic"). On the 12th of August 2020, 20,412,501 cases were reported globally (Johns Hopkins Center for Systems Science and Engineering, 2020).

Since the CODIV-19 pandemic has become a part of everyday life, researchers have begun to investigate how people’s lives are affected by the virus. Given the purpose of this research, we focused on studies that have impacted people’s sex lives and how this type of virus has altered or not their sex lives.

Given the growing interest in this topic and the growing number of publications, we decided to conduct a meta-analysis to find out how the COVID-19 pandemic affected/and still affects people’s sex life and sexual behavior. Taking into consideration the growing number of cases, it is essential to find answers to how this pandemic affects people’s sex lives, so that solutions to these issues can be found in the future. The more similarities are observed between studies, the greater the chances are to finding answers to this issue. The analysis of different existing studies is one of interest because this will be useful when answers to questions such as: ‘‘Does the COVID-19 pandemic affect people’s sexual lives?’’ ‘‘What are the factors that affect sex life?’’, etc. are demanded.

Since its discovery, the COVID-19 virus has been epidemiologically associated with the Huanan Seafood Wholesale Market, where fish and wild animals are sold at a local level (Huang et al., 2020). Subsequent evidence of this clinical infection suggests that SARS-CoV-2 is transmitted from person to person (Wang et al., 2020). Massive alveolar damage and progressive respiratory failure can lead to severe death, and the number of lymphocytes, macrophages, leukocytes, biomarkers related to infection, inflammatory cytokines and T cells are also altered in patients with severe conditions (World Health Organization, 2020a, "Coronavirus", World Health Organization, 2020b, "Defining sexual health"). According to the World Health Organization, the most common symptoms of COVID-19 are: fever, dry cough, fatigue, and some of the most common symptoms include: sore throat, diarrhea, conjunctivitis, headache, loss of taste or odor, rash on the skin or discoloration of the fingers or toes; the most serious symptoms that require immediate attention being shortness of breath and difficulty breathing, chest pain or pressure, loss of speech and movement (Jacob et al., 2020).

Sexual life, sexuality encompasses a multitude of phenomena, which include partnerships, behaviors, attitudes, identity, orientation, beliefs and activities (Li et al., 2020) and specifically the sexual activity can include a multitude of acts, including the penetrative sex (vaginal, anal), oral sex and mutual masturbation. Moreover, a safe and frequent sex life is associated with a multitude of benefits for both physical and mental health (Hensel et al., 2020), thus the current context and especially the period in which people were quarantined (in lockdown) is of interest in the study of people’s sex lives.

The main purpose of this research is to analyze existing studies, to find out how the COVID-19 pandemic affected people’s sex life and their sexual behavior. At the time of writing this study, any other meta-analysis studies were found to investigate this issue.

Method

Literature review

An exclusively electronic search was performed to discover articles published until the 3rd of July 2020 without a specific starting point. The identified studies were searched in the databases of ProQuest and Google Scholar. The key words for the search were: pandemic, COVID-19, sexual life, sexual behavior, satisfaction, marital status, Coronavirus disease.

Inclusion/exclusion criteria

The initial search resulted in 64 articles, and the first criterion for these to be included in the research was for the studies to be quantitative and published in English. The other criteria for inclusion in the study were:

- sexual behavior to be clearly defined;
- to investigate the relationship between the COVID-19 pandemic and sexual intercourse;
- the COVID-19 pandemic to be clearly defined;
- to investigate the effects of COVID-19 on sexual life;
- sufficient data exist so the size of the effect can be calculated. Based on the inclusion/exclusion criteria, a number of 7 articles were included in this research (Fig. 1).

Instruments used

Cocci — the data was collected through an online survey, taking a close look at sexual behavior before and after pandemic. Beck Depression Inventory and Beck Anxiety

Figure 1 Number of articles included in the study.
Table 1  Summary of studies included in the meta-analysis.

| Study            | Country | Study type | Study format          | Period          | No. of participants | Medium age | %F | Marital status                     | Sexual orientation |
|------------------|---------|------------|-----------------------|-----------------|--------------------|------------|----|------------------------------------|--------------------|
| Cocci et al., 2020 | Italy   | Quantitative | Survey               | NA              | 1515               | 21         | NS | NS                                 | Straight           |
| Hensel et al., 2020 | USA     | Quantitative | Survey               | April 10–20     | 1010               | 34.4       | 51.5| 66.1% — married                    |                    |
|                  |         |             |                      |                 |                    |            |    | 33.9% — not married                |                    |
| Jacob et al., 2020 | UK      | Quantitative | Survey               | March 17–26     | 868                | NS         | 63.1| 55.3% — married                    | Straight           |
| McKay et al., 2020 | USA     | Quantitative | Survey               | April 10 to May 10 | 1968             | 44.6       | NS | 44.7% — single                    | LGBTQ+ bisexual    |
| Sanchez et al., 2020 | USA     | Quantitative | Survey               | April 2–13      | 1051               | 35         | 0   | 54.2% — married                    | LGBTQ              |
| Yuksel and Ozgor, 2020 | Turkey  | Quantitative | Observational study — mixed Survey | March 11—April 12 | 58                | 26.6       | 100 | 100% — married                    | Just females       |
| Li et al., 2020 | China   | Quantitative | Survey               | March 13–15     | 459                | NS         | 41.17| 53% — married                      | Straight           |
|                  |         |             |                      |                 |                    |            |    | 47% — not married                  |                    |

NA: Not available.
Inventory were also used in this body of research, the scales were validated on Italian population.

Hensel — consists 26 questions that measure sexual behaviors, available in Spanish and English.

Jacob — online survey that has questions regarding sexual behavior, demographic details and health status.

McKey — online survey that has questions from Stanford study of Americans’ concerns about COVID-19, symptoms and individual behavioral changes, sexual behavior measures from the last 30 days, changes in sexual behavior due to COVID-19, the use of dating apps.

Sanchez — this questionnaire measures the impact that COVID-19 has had in the following areas: general well-being, sexual and substance use behavior, HIV and STI prevention, HIV treatment.

Weiran Li — this questionnaire has 12 items that measure demographic characteristics and sexual behavior from the past and present.

Yuksel — this instrument for a Female Sexual Function Index (Cronbach’s Alpha = 0.92, test-retest reliability coefficients 0.79 – 0.86), detailed questions about medical history and demographic characteristics.

The studies included in the meta-analysis measured covariables, for example Cocci et al., measured covariables such as anxiety and depression. Hensel et al., measured the number of children that the participants had, depression symptoms, and perceived loneliness in the last month, behavior and knowledge about COVID-19. Jacob et al. measured covariables such as health status.

McKay et al. measured covariables such as the use of dating websites and applications in order to find a new sexual partner. Sanchez et al. measured covariables such as general health status, use of substance, HIV treatment. Weiran Li et al., the covariables were sexual orientation, medical history, sexually transmitted disease status. Yuksel et al. measured covariables such as health status.

For the analysis of data obtained, the Comprehensive Meta-Analysis was used. We chose to analyze the data using the “odds ratio” to be able to observe how many times did the sexual activity of the population change. An “odds ratio” less than 1, indicates a decrease in targeted activities for the observed group. An odds ratio of 1 indicates that there is no change between the two groups, as the probability of engaging in sexual relations is the same as before the pandemic. While, an odds ratio bigger than 1, indicates that people have more sexual activity than before (Table 1).

Results

The database search resulted in 64 articles, of which only 7 met the inclusion criteria. The countries where the studies were conducted are the United States of America, 3 studies, the United Kingdom, one study, Italy, one study, China, one study and Turkey, one study. Most of the studies were of the survey type, given the context of the pandemic and the limitations it exerts on researchers. The 7 studies included a number of 6929 participants, the average age of the studies reaching a minimum of 21 years and a maximum of 44.6. The populations on which the studies were conducted were belonging both to the LGBTQ community and people with a heterosexual orientation.

We used the random model to calculate the “odds ratio”, because the $Q$ probability is estimated at 0.05, and the value of $I^2$ is 98.508. The two indicators point to the fact that there is some heterogeneity in our data, which can be given by the population sexual orientation, by cultural differences and repopulations, but also by age differences and social expectations relevant to each age. As it can be seen in Fig. 2, the odds ratio in this case is 0.227 (95% CI [0.097–0.796], $P=0.017$), which means that, before the pandemic, there is a probability of approximately 4.4 times more involvement in sexual behavior than during the pandemic.

When testing for the publication bias, as it can be observed in Fig. 3, the “odds ratio” remains unchanged, which means that there is no publication bias. A total of 546 studies should not have been published for the $p$ value to become greater than the alpha value of 0.05. The “trim and fill” analysis also supports the absence of a publication
bias, indicating that there is no need to abandon or add a study to achieve symmetry.

Another variable considered to be important in understanding sexual activity during the pandemic is desire, and the "odds ratio" from Fig. 4 for sexual desire during the pandemic indicates that that sexual desire is likely to be smaller during the pandemic, even if this difference in probabilities is not statistically significant.

Discussion

The purpose of this meta-analysis was to analyze existing research and provide an answer to the question "Has the COVID-19 pandemic affected peoples’ sex lives?" as noted in the results section, from the data analysis, sexual activity was reduced with a frequency of 4.4 times during the pandemic in comparison to the period before. This decrease can be caused by the major change that took place during this period but also by the danger perceived by people; it is possible that after this anxiety, caused by COVID-19, sexual activity will return to normal. As we all know, humans have innate capabilities to preserve their own life, which are stronger that the desire to reproduce, so the death anxiety felt by the population right now might be held accountable for decreasing the desire to be sexually intimate with others. Also, the limitations imposed by the government had influenced the level of depression in the general population which by its own definition translates into lower sexual desire. What is certain is that the changes we have been subjected to, led to a decrease in sexual activity.

When analyzing sexual desire (Fig. 4) we observed that before the pandemic there was a 2.5 higher probability of sexual desire, but from a statistical point of view, this result is not significant.

Regarding the theoretical and practical implications of this study, the results show a decreasing trend in sexual activity, which needs to be further analyzed if an intervention, will be needed to increase sexual activity.

Given the complexity of the situation and the large number of areas in which the COVID-19 pandemic left its mark, it is necessary to study as many aspects as possible and provide answers to as many issues as possible. Although the main focus of most research at the moment is finding a treatment for the virus, it is important to study how people have adapted to this situation. We have tried to see how this pandemic left its mark on the quality of human lives, and some of the impediments encountered are a result of the low number of publications in this field, but also to the fact that, at the time of this research, the COVID-19 pandemic was rampant (Rus et al., 2020).

Therefore, pre/post-pandemic analysis of the impact of this challenging period on human sexual life was not possible, but only one applied to the period before the pandemic; subsequent research, post-pandemic, could perform such an analysis. Although as many groups as possible were included in this analysis, we do not have information on how people, with psychological and psychological vulnerabilities, have reacted to the measures imposed by this pandemic.

Another impediment faced during this research was the narrow period of time that allowed us to select studies from the period January–May 2020.

Future research on this topic could include more studies, to select studies over a longer period of time, and at the same time a repetition of this analysis, after the COVID-19 pandemic, would be preferable.

Conclusion

The present research aimed to verify if the COVID-19 pandemic affected people’s sexual lives. In terms of results, a decrease in sexual activity was observed, which indicates the impairment of the individuals’ quality of sexual life. Thus, one can conclude that before the pandemic, the probability of people engaging in sexual activity was higher than during the pandemic, seen as the period when this analysis was made.

Disclosure of interest

The authors declare that they have no competing interest.

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