Response

Dear Editors and Reviewers:

Thank you for your letter and for the reviewers' comments concerning our manuscript entitled "Associations between social support and anxiety during the COVID-19 Lockdown in young and middle-aged Israelis: a cross-sectional study" (NO: 76286).

These comments are very constructive and helpful for revising our paper. We have discussed the comments carefully and have made revisions which we hope will be met with approval. They are all marked in red in the revised version. The main answers to the reviewer's comments are as follow:

Reviewer 1:

Abstract

Background:

- Acronyms need to be written in full form the first time, and given short form in parenthesis, after that, you can use them consistently.
- Line 23…. COVID-19 lockdown…correct as Coronavirus disease (COVID-19)

Response：

Thank you for your reminder! We've made corrections on line 24. All revisions are marked in red.

-Line 28…." A total of 655 individuals aged 26–47 years took part in the present study".

Response： Thank you for your suggestion! we have changed it to "A total of 655 individuals took part in the present study." All revisions are marked in red.

Introduction

-Line 45" Coronavirus 19 (COVID-19) … correct like Coronavirus disease 2019 (COVID-19)

Response：

Thank you for your reminder! We've made corrections on line 45. All revisions are marked in red.

-Please include hypothesis to be tested

Response： Thank you for your suggestion! We have added hypothesis to the introduction. For details, see line 71.

Methods and material

-Line 87…" The responses to the questionnaire were collected over an eight-day period from April 19 to May 2, 2020, when…." The time frame "April 19 to May 2" exceeds 8 days please correctly specify exact time.

Response：

Thank you for your reminder! I'm very sorry that this is our mistake. We have made a correction on line 87. All revisions are marked in red.

-Line 96… "A total of 655 participants aged 26-47 took part".
-Why author used age class of 26-47 only? As mentioned on the title, interest is those at young and middle age, hence author should correct this statement.
I recommend this should be correct as "A total of 655 participants took part in current study"

Response： Thank you for your wonderful comments! According to your suggestion, we have made changes on line 95. All revisions are marked in red.

-Line 97-98…" Participants who failed to complete all the questionnaires were

excluded."

How many respondents declined to complete the survey or provided incomplete information? Please specify response rate.

Response： Thank you for your excellent suggestion! We have added details on the response rate on lines 95-99. All revisions are marked in red.

-Line 107-108…." with scores ranging from 0 to 21, where ≥5, ≥10 and ≥15 represent mild, moderate and severe anxiety symptoms, respectively. Please specify categories and corresponding cut point correctly. I recommend to correct as "… with scores ranging from 0 to 21. These scores represent 0–4 (minimal anxiety), 5–9(mild anxiety), 10–14 (moderate anxiety), and 15–21 (severe anxiety)."

Response： Thank you for your wonderful comments! According to your suggestion, we have made changes on lines 108-110. All revisions are marked in red.

-Line 111-116 please provide categories and outpoint for social support Assessment tool of "Multidimensional Perceived Social Support Scale (MSPSS)".

Response： Thank you for your suggestion! We have provided categories and outpoint of MSPSS in Appendix 1.

-Line 132-134… "The MSPSS scores were graded by quartile (quartile: ≥75th percentile, quartile: ≥50th to 75th percentile, quartile 2: ≥25th to 50th percentile, quartile 1: <25th percentile)." This sentence not clear. Please correctly write ranges for quartile.

Response： Thank you for your pertinent comments! According to the opinion 12 of reviewer 2, we have changed the statistical method of this study, so this

part has been deleted.

Results

-Line 151…title 3.2. "The MSPSS was associated with the GAD-7 score" should be re-written. Giving conclusion on title is not usual. I recommend "3.2 Association of MSPSS with the GAD-7 score"

Response：Thank you for your suggestion! In accordance with your suggestion, we have changed title 3.2 to "3.2 Association of MSPSS with the GAD-7 score"on line 141. All revisions are marked in red.

-Line 161… "3.3. The MSPSS was associated with anxiety" correct similarly as previous one.

Response：Thank you for your suggestion! In accordance with your suggestion, we have changed title 3.3 to "3.3 Association of MSPSS with anxiety"on line 150. All revisions are marked in red.

Discussion

-Well written and organized.

-Please discuss the following important related works, seems they are missing:

https://doi.org/10.1186/s12991-022-00385-3

https://doi.org/10.1080/19371918.2020.1808144

Response： Thank you for your affirmation and pertinent suggestions! We have discussed these two articles in the discussion. For details, see lines 221-226.

Additional comments

-To make acronyms and/or abbreviations easier to understand for the reader, a list of acronyms and/or abbreviations should be mentioned.

Response： Thank you for your pertinent suggestions! We provide a list of

acronyms and/or abbreviations in Appendix 3.

-Please provide questionnaire (implemented in this study) as supplementary material.

Response : Thank you for your pertinent suggestions! We provide questionnaire in Appendix 2.

Reviewer 2:

1. "Snow ball" is not the professional term for the manner of data collection described. It should state convenience sampling with additional limitations for generalization of results when using this method. A reference on convenience sampling compared to other methods is required.

Response: Thank you for your comments! Snowball sampling is a kind of sampling method which expands step by step by virtue of the naturally formed interpersonal network like snowball. I am very sorry that we do not know a more standard word to replace "snowball". We have seen this expression in other articles and hope to get your understanding. We listed two articles that mentioned snowball sampling below.

https://doi.org/10.1093/aje/kwab098

https://doi.org/10.1016/j.drugalcdep.2013.11.020

2. In the data analysis I missed the used of the correction for multiple comparisons. This is important since the use adjusted and non-adjusted models is not justified in the text and seems like trying to get significance anyway you can get it.

Response: Thank you for your pertinent suggestion! In order to avoid the suspicion of manipulating the data, we used univariate and multivariate logistic and linear regression comparative analysis to find that anxiety and social support are still negatively correlated, and replaced Table 2 and Table 3. The description of the results in the abstract(lines 28-36); the covariates(lines 119-121), statistical analysis(lines 123-126) in the methods; the description of the results(lines 143-149; lines 152-157) in the main text; the description in the discussion(lines 170-172) have been changed accordingly. All revisions are marked in red.

3. Line 56: I do not agree with the sentence. Social support is significantly important always not just for individuals with "heavy burden". See works by Miculincer and Shaver.

Response: Thank you for your pertinent suggestions! According to your suggestion, we have made changes on lines 56-57. All revisions are marked in red.

4. Line 58: social support is not a simple source for many individuals and I fail to understand what is "simpler" about this social support which is a complex developmentally based and inherent in human evolution process. See works on loneliness during the COVID by Gil Zalsman.

Response: Thank you for your suggestions! According to your suggestion, we have made changes on lines 59-60. All revisions are marked in red.

5. Line 65: did the authors mean inverse correlation?

Response: Thank you for your comment！ It is indeed a negative correlation. We have made it clear on lines 65-67. All revisions are marked in red.

6. Line 70: this sentence should be one of the highlights of this study.

Response: Thank you for your excellent comment！ Indeed, we realized that this is the highlight of our study and revised it to the hypothesis in the introduction. For details, please see the red mark on lines 71-73.

7. Line 74: not correct. Please conduct a literature search.

Response: Thank you for your reminder! We have deleted this sentence and modified lines 74-76. All revisions are marked in red.

8. Line 91: what do the authors mean in the term with the word shelter? Is it connected to the COVID or to a war situation in Israel? This is not a term I find in the immense COVID mental health literature.

Response: Thank you for your pertinent comments! We have changed the statement on line 89. All revisions are marked in red.

9. Limitations on generalization to younger and older ages should be included.

Response: Thank you for your pertinent comment! This is indeed our deficiency, and we have added this to the limitation. For details, please see the red mark on line 239.

10. Line 138: why two tailed if the hypothesis as it arises from- although not stated clearly in, the introduction, in one-tailed?

Response: Thank you for your pertinent comments! As far as we know, the purpose of the study is to determine whether the mean values of the two data are different, which requires a double-tailed test. The purpose of the study is to know whether the average value of one data is higher (or lower) than another data, then one-tail test can be used. In our study, we compared whether the average value of anxious or non-anxious people is different, we refer to the following literature:

https://doi.org/10.1016/j.jad.2021.03.021

11. Line 160: were questions on the COVID situation and being infected or exposed to infected individuals included in the survey? If not, this should be stated in the limitations.

Response: Thank you for your comments! We are very sorry that the 655 questionnaires we collected did not include participants who had been or are infected with COVID-19. According to your suggestion, we have stated in the limitations. For details, please see the red mark on lines 240-242.

12. The paper requires careful editing and proof reading. There are many typos and extra spaces.

Response: Thank you for your reminder! We checked it carefully.

13. Line 187: not true. Please conduct a literature search.

Response: Thank you for your reminder! We have deleted this sentence.

14. 204: The meaning of this sentence is unclear.

Response: Thank you for your reminder! We have changed the expression of the sentence. For details, please see the red mark on line 186.

15. Line 208: the term protective is misleading as it implies causality which is not the case in this study.

Response: Thank you for your comment! We have changed the expression of the sentence. For details, please see the red mark on line 191.

16. Lines 210-229: how this paragraph relates to the results of the current study? Make a concluding statement following all these citations.

Response: Thank you for your comments! We made a concluding statement at

the end of this paragraph. For details, please see the red mark on lines 209-211.

17. Line 239: not true. Please conduct a reliable literature search.

Response: Thank you for your comments! We changed the statement and discussed some literature accordingly. For details, please see the red mark on lines 220-225.

18. Finally, line 247: not true. See Ferber et al, in Anxiety Stress and Coping, Ferber et al, in Frontiers in Psychiatry.

Response: Thank you for your comments! We changed the statement. For details, please see the red mark on line 230.

Re-reviewer:

Comments: Since authors fully addressed all comments raised. I recommend the paper for publication.

Response: Thanks for your comments.

All of the revisions are shown here. We would like to express our great appreciation to you and reviewers for comments on our paper.

Looking forward to hearing from you.

Best regards,

Zezhang Tao

Associations between social support and anxiety during the COVID-19 Lockdown in young and middle-aged Israelis: a cross-sectional study

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Abstract

Background: This study examined the associations between social support and anxiety during the Coronavirus disease 2019 (COVID-19) in an Israeli sample.

Methods: Data for this cross-sectional study were retrieved from an online survey. Linear regression, logistic regression and restricted cubic spline models were conducted to test for associations between social support and anxiety.

Results: A total of 655 individuals took part in the present study. In the univariate linear regression model, there is a negative correlation between the Generalized Anxiety Disorder-7 score (GAD-7) and the Multidimensional

Perceived Social Support Scale (MSPSS) score. For MSPSS score, the multivariable adjusted regression coefficient and 95% confidence interval (CI) of GAD-7 score were -0.779 (-1.063, -0.496). In the univariate logistic regression model, there was a negative correlation between anxiety (GAD-7≥9) and MSPSS score, and there was still a negative correlation in multivariate logical regression analysis. The odds ratios (OR) and 95%CI were 0.709 (0.563, 0.894).

Conclusion: Social support was inversely correlated with anxiety during COVID-19 in an Israeli sample.

Keywords: Cross-sectional study; Social support; Anxiety; COVID-19; Lockdown; Correlation.

1 Introduction

Coronavirus disease 2019 (COVID-19) is a worldwide pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). COVID-19 was first reported in Wuhan, China, causing pneumonia and other respiratory complications. Due to the massive spread and high infectivity of the virus, most countries have adopted various lockdown measures to control the epidemic. Changes in social distance and daily life activities during the blockade can affect personal well-being, mental health, and increase the risk of mental illness[1]. Anxiety disorder is one of the most common mental disorders.

Anxiety disorder is a common mental disorder with a global incidence of 7.3%[2]. Patients with anxiety disorders often feel excessive fear, anxiety or aim to avoid threats in the environment and within themselves, which can lead to disability and places a heavy burden on individuals and society[3]. Adequate social support is always significantly important for an individual's mental health. There are no significant side effects associated with social support, as compared to typical drug therapy. In addition, social support is one of the

social resources to deal with stressful life events[4]. Social support is defined as allowing individuals to take advantage of the positive effects of social interactions to directly protect their mental health and directly resist stressful situations. Social support, as a function of interpersonal emotion regulation, can reduce the risk of mental illness[5]. In a trial of 947 colorectal cancer patients in Spain, patients with more social support were more likely to have better results in anxiety and depression one year after surgery[6]. In patients with multiple sclerosis, higher social support was associated with lower depression and anxiety[7]. In a cross-sectional study of young pregnant women, pregnant adolescents with anxiety disorders were found to have less social support in all areas[8]. Similarly, adolescents' exposure to negative life events was shown to be associated with social anxiety disorder, whereas changing social support can reduce anxiety symptoms in at-risk adolescents[4]. It is, thus, assumed that this inverse association exsits between the absence of social support and anxiety in different negative events and various populations.

It is not clear whether social support is equally protective of anxiety disorders in the context of the unique features of the first wave of COVID-19 pandemic in Israel in particular during lockdown. This study used data from an interim study on the lockdown enforced during the first wave of the COVID-19 pandemic in Israel to clarify the potential associations between social support and anxiety disorders.

2 Materials and methods

2.1 Data collection

The Qualtrics[XM] platform (https://www.qualtrics.com/) digital questionnaire for data collection method was implemented in this study. It included a sociodemographic and personal questionnaire, the Generalized Anxiety Disorder-7 (GAD-7), the Multidimensional Perceived Social Support (MSPSS) and other measures and was administered using a snowball sampling method to recruit participants across Israel via email and mobile phone

applications. All responses were anonymous. The responses to the questionnaire were collected from April 19 to May 2, 2020, when Israel was experiencing the peak of the first wave of the COVID-19 epidemic. During that time, the government imposed three weeks of strict lockdown measures, banning social gatherings. The experimental procedure was approved by the Ethics Committee of The Academic College of Tel-Aviv Yafo, Israel (Approval No. 2020085), and all participants an signed electronic informed consent, allowing access to the full set of questionnaires[9].

2.2 Sample

A total of 655 participants took part. 200 participants did not complete the questionnaire. Of these, 45% did not complete sociodemographic and personal questionnaire. Of the remaining 55% of participants, only 1.3% completed the GAD-7 questionnaire. Participants who failed to complete all the questionnaires were excluded. The inclusion criteria were over 18 years of age and fluent in Hebrew.

2.3 Demographic Information

The demographic information included the participants' age, gender, and socioeconomic status (based on questionson assessment of educational level, subjective perception of socioeconomic status, and financial resources for the next three months).

2.4 Assessment of anxiety

The GAD-7 is a self-reported anxiety questionnaire that can measure the anxiety level of the general population with sufficient validity and accuracy[10]. The Hebrew version was used, which contains 7 items, with scores ranging from 0 to 21. These scores represent 0–4 (minimal anxiety), 5–9 (mild anxiety), 10–14 (moderate anxiety), and 15–21 (severe anxiety). In this study, anxiety was defined as an overall score ≥9[11]. The internal consistency of the current sample was α= 0.892.

2.5 Assessment of social support

Social support was evaluated on the Hebrew version of the Multidimensional Perceived Social Support Scale (MSPSS), which assesses participants' subjective feelings about their degree of social support[12]. The scale consists of three sub-scales related tofamily, friends, and significant others, with a total of 12 items. The higher the participants' scores, the more social support they felt.

2.6 Covariates

Covariates includes demographic variables (age, gender) and other background factors, including number of children, education, socioeconomic status, occupation, exercise and use of antidepressants.

2.7 Statistical analysis

SPSS 20.0 and R 3.5.1 were used for analysis. Linear regression was performed to analyze the association between social support and anxiety symptoms. Logistic regression was performed to examine the association between social support and anxiety disorders (GAD-7 score ≥9). To further investigate the relationship between social support and anxiety, a restricted cubic spline analysis was performed in the fully adjusted model. P values of less than 0.05 (two-tailed) were considered statistically significant.

3 Results

3.1. Sample characteristics according to GAD score

Table 1 shows the characteristics of the 655 participants in terms of GAD-7 scores. The sample was composed of 246 men and 409 women, with a median age of 30. There were significant differences in age, gender, number of children, education, socioeconomic status, occupation, history of depression, and use of antidepressants between those with and without anxiety disorders (GAD-7 score ≥9). Those classified as exhibiting anxiety were younger than those who were classified as not exhibiting anxiety. Anxiety was also more common among women. Of the participants classified as anxious, 80% had no children, 50% had a bachelor's degree, 41.1% had an average economic status and 54.2%

had a full-time or part-time job.

3.2. Association of MSPSS with the GAD-7 score

Table 2 uses linear regression to analyze the association between social support and anxiety symptoms. In the univariate linear regression model, GAD-7 score was negatively correlated with MSPSS score, and the regression coefficient and 95% confidence interval (CI) were -0.692 (-0.990, -0.394). Further multivariate linear regression analysis showed that there was still a negative correlation between GAD-7 score and MSPSS score, and the regression coefficient and 95%CI was -0.779 (-1.063, -0.496). This negative correlation was independent of age, sex, socio-economic status and the use of antidepressants.

3.3. Association of MSPSS with anxiety

Table 3 shows the odds ratios (OR) and the 95%CI for social support and anxiety disorders (GAD-7 score ≥ 9). In the univariate logistic regression model, the occurrence of anxiety was negatively correlated with MSPSS score. Multivariate logical regression analysis with backward method showed that the occurrence of anxiety was still negatively correlated with MSPSS score, and the OR and 95%CI were 0.709 (0.563, 0.894). This negative correlation is independent of gender, age, education level, socio-economic status and the use of antidepressants.

3.4. Restricted cubic spline analyses

To further clarify the relationship, a restricted cubic spline analysis was used to analyze the association between social support and anxiety (Figure 1). The results showed that social support was inversely correlated with anxiety symptoms (GAD-7 score ≥9). Anxiety symptoms decreased with increasing social support scores.

4 Discussion

In this study, a cross-sectional analysis was conducted using data from an interim study conducted while Israel was in lockdown during the first wave

of the COVID-19 pandemic to assess the relationship between social support and anxiety symptoms. The data included 655 participants. The results showed that participants' social support scores were inversely correlated with GAD-7 scores. Social support was inversely associated with anxiety (GAD-7 score ≥9) in logistic regression model, and this negative correlation is independent of gender, age, education level, socio-economic status and the use of antidepressants.

During the COVID-19 pandemic, people in most countries were placed under tight lockdown measures due to the dangers of the rapid spread of the disease and the severe shortage of medical resources. In instances of insufficient supply and personnel, medical workers tend to give priority to serious physical diseases and ignore patients' mental symptoms[13]. At the same time, for quarantined individuals, the panic caused by the COVID-19 outbreak, as well as the economic losses caused by the lockdown, the lack of protective gear and other complications all exacerbated the psychological difficulties. In an epidemiological survey conducted in Hong Kong, 25.4% of the population's mental health was reported to have deteriorated since the outbreak of COVID-19, and 14% of the population suffers from anxiety[14]. Anxiety is an emotion characterized by physical changes such as tension, anxious thoughts and elevated blood pressure, with a lifetime prevalence rate of more than 20%[15]. When severe Acute Respiratory Syndrome (SARS) broke out in Hong Kong in 2013, 13% of the population developed anxiety disorders after discharge from hospital[16]. Anxiety disorders often occur at the same time as post-traumatic stress disorder (PTSD). Pre-existing anxiety has been proved to be a risk factor for the development of urban population into PTSD[17]. Studies have shown that participants with higher symptoms of depression and anxiety are more likely to develop more severe PTSD symptoms, and higher social support may be associated with lower PTSD[18].

Social support, as a way to foster a sense of belonging and love, is crucial

for the mental health of the population. Social support can promote mental health in several ways. First social support can enable people receive more information and care from others. Certain specific groups, such as pregnant and postpartum mothers and parents of young children with special medical needs can obtain social support from social media to relieve negative emotions such as psychological anxiety and glean useful suggestions[19, 20]. During the lockdown period, people mainly used social media to get social support from a range of sources to ease anxiety and fight the epidemic collectively. Second, social support can alleviate people's pain, and can encourage physical activity, including those who are physically limited by pain, and thus have a positive impact on people's health behaviors[21]. Finally, social support can improve individuals' physical condition and promote mental health by directly influencing the body's pathophysiological mechanisms. Studies have found that people with higher social support and integration have lower mortality rates, and a comprehensive meta-analysis has shown that social support is inversely correlated with inflammation levels in vivo[22]. In addition, social support can significantly reduce the cardiovascular response of the population and lower cardiovascular recovery to its pre-stress level[23]. All these studies thus suggest that social support not only provides information and care from the outside world, but also modulates the mental health of the population by reducing physical pain and improving inflammation levels.

In a cross-sectional study of women who had undergone a therapeutic abortion, more than half reported symptoms of anxiety, and social support from these women's family and friends significantly reduced anxiety levels. Furthermore, social support from partners can also reduce women's anxiety symptoms[24]. Another longitudinal cohort study of caregivers of patients diagnosed with cancer showed that accurate information and social support from other members of the community, as well as physical activity reduced anxiety in partners in the first months after a cancer diagnosis[25]. These

epidemiological studies underscore the positive effects of social support on anxiety disorders. Similarly, during the special period of COVID-19 's outbreak, in a cross-sectional survey of 3500 Spanish adults, it was found that for those without pre-pandemic mental disorders, higher levels of social support decreased the odds of GAD-7[26]. During the COVID-19 pandemic in Turkey, it was also found that anxiety levels decreased significantly when perceived social support increased[4]. This study conducted a survey during Israel's first blockade in 2020, taking into account the effects of age, sex, number of children, education level, socio-economic status, occupation, exercise and antidepressant use, the results here show that social support is negatively correlated with post-blockade anxiety.

This study makes several contributions beyond its limitations. Using data collected during the first wave of COVID-19 lockdown in Israel, this study reports on relationship between social support and anxiety during COVID-19 lockdown. In addition, we considered the impact of confounding factors such as age, gender, education, socioeconomic status and other potential influences. Note, however, that the cross-sectional design of this study is a major limitation because it is difficult to make causal inferences. Second, the results were adjusted for a variety of major potential confounding factors; however, the existence of unmeasured factors and some unknown factors cannot be ruled out. Third, randomly distributed questionnaires may lead to age selection bias of the study population, which may make the results not generalized. Fourth, this study does not include the limitations on generalization to younger and older ages. Fifth, this study does not include people who have been infected with COVID-19, whether infected with COVID-19 may have an impact on the correlation coefficient between social support and anxiety.

Prolonged home confinement may be the main reason that affects people's mental health during the blockade of the COVID-19 pandemic, and it is very important to give proper physical and mental care and social support. In

addition, the long epidemic period of COVID-19 and the continuous mutation of virus strains undoubtedly bring new challenges to people's mental health. How to make rational use of multimedia or the Internet to improve the psychological state of the population during the COVID-19 blockade is a research direction worthy of attention for future researchers.

Overall our findings suggest that social support was inversely associated with anxiety symptoms during COVID-19 pandemic lockdown. Thus providing social support may reduce the prevalence of anxiety in the population.

Ethical Approval and Informed Consent

The experimental procedure was approved by the Ethics Committee of the Academic College of Tel-Aviv Yafo, Israel (Approval No. 2020085), and all participants signed an electronic informed consent.

Consent for publication

Not applicable

Availability of data and materials

All other data are available from the corresponding author on reasonable request

Competing interests

The authors have no conflicts of interest to declare.

Funding

No funding.

Author Contributions

Yang Xi: Data analysis, and interpretation

Odelia Elkana: Data acquisition

Di Li:　Data analysis and interpretation

Woer Jiao: Data acquisition, analysis, and interpretation

Zezhang Tao: Study conception and design final approval of the manuscript for submission

References

1　　　Ortenburger D, Mosler D, Pavlova I, Wąsik J. Social Support and Dietary Habits as Anxiety Level Predictors of Students during the COVID-19 Pandemic. Int J Environ Res Public Health. 2021 Aug 20;18(16):8785. doi: 10.3390/ijerph18168785. PMID: 34444534; PMCID: PMC8391247.

2　　　Baxter AJ, Scott KM, Vos T, Whiteford HA. Global prevalence of anxiety disorders: a systematic review and meta-regression. Psychol Med. 2013 May;43(5):897-910. doi: 10.1017/S003329171200147X. Epub 2012 Jul 10. PMID: 22781489.

3　　　Baxter AJ, Vos T, Scott KM, Ferrari AJ, Whiteford HA. The global burden of anxiety disorders in 2010. Psychol Med. 2014 Aug;44(11):2363-74. doi: 10.1017/S0033291713003243. Epub 2014 Jan 22. PMID: 24451993.

4　　　Özmete E, Pak M. The Relationship between Anxiety Levels and

Perceived Social Support during the Pandemic of COVID-19 in Turkey. Soc Work Public Health. 2020 Sep 1;35(7):603-616. doi: 10.1080/19371918.2020.1808144. PMID: 32970545.

5   Viseu J, Leal R, de Jesus SN, Pinto P, Pechorro P, Greenglass E. Relationship between economic stress factors and stress, anxiety, and depression: Moderating role of social support. Psychiatry Res. 2018 Oct;268:102-107. doi: 10.1016/j.psychres.2018.07.008. Epub 2018 Jul 7. PMID: 30015107.

6   Gonzalez-Saenz de Tejada M, Bilbao A, Baré M, Briones E, Sarasqueta C, Quintana JM, Escobar A; CARESS-CCR Group. Association between social support, functional status, and change in health-related quality of life and changes in anxiety and depression in colorectal cancer patients. Psychooncology. 2017 Sep;26(9):1263-1269. doi: 10.1002/pon.4303. Epub 2016 Dec 19. PMID: 28872742.

7   Ratajska A, Glanz BI, Chitnis T, Weiner HL, Healy BC. Social support in multiple sclerosis: Associations with quality of life, depression, and anxiety. J Psychosom Res. 2020 Nov;138:110252. doi: 10.1016/j.jpsychores.2020.110252. Epub 2020 Sep 16. PMID: 32971435.

8   Peter PJ, de Mola CL, de Matos MB, Coelho FM, Pinheiro KA, da Silva RA, Castelli RD, Pinheiro RT, Quevedo LA. Association between perceived social support and anxiety in pregnant adolescents. Braz J Psychiatry. 2017 Jan-Mar;39(1):21-27. doi: 10.1590/1516-4446-2015-1806. Epub 2016 Aug 4. PMID: 27508395; PMCID: PMC7112740.

9   Oryan Z, Avinir A, Levy S, Kodesh E, Elkana O. Risk and protective factors for psychological distress during COVID-19 in Israel. Curr Psychol. 2021 Jul 5:1-12. doi: 10.1007/s12144-021-02031-9. Epub ahead of print. PMID: 34248314; PMCID: PMC8257084.

10   Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, Herzberg PY. Validation and standardization of the Generalized

Anxiety Disorder Screener (GAD-7) in the general population. Med Care. 2008 Mar;46(3):266-74. doi: 10.1097/MLR.0b013e318160d093. PMID: 18388841.

11   Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006 May 22;166(10):1092-7. doi: 10.1001/archinte.166.10.1092. PMID: 16717171.

12   Johnston L, Steinhaus M, Sass J, Benjarattanaporn P, Sirinirund P, Siraprapasiri T, Gass R. The Associations of Perceived Social Support with Key HIV Risk and Protective Factors Among Young Males Who Have Sex with Males in Bangkok and Chiang Mai, Thailand. AIDS Behav. 2018 Jun;22(6):1899-1907. doi: 10.1007/s10461-017-1904-5. PMID: 28900764.

13   Arya A, Buchman S, Gagnon B, Downar J. Pandemic palliative care: beyond ventilators and saving lives. CMAJ. 2020 Apr 14;192(15):E400-E404. doi: 10.1503/cmaj.200465. Epub 2020 Mar 31. PMID: 32234725; PMCID: PMC7162443.

14   Choi EPH, Hui BPH, Wan EYF. Depression and Anxiety in Hong Kong during COVID-19. Int J Environ Res Public Health. 2020 May 25;17(10):3740. doi: 10.3390/ijerph17103740. PMID: 32466251; PMCID: PMC7277420.

15   Singh R, Singh B, Mahato S, Hambour VK. Social support, emotion regulation and mindfulness: A linkage towards social anxiety among adolescents attending secondary schools in Birgunj, Nepal. PLoS One. 2020 Apr 2;15(4):e0230991. doi: 10.1371/journal.pone.0230991. PMID: 32240242; PMCID: PMC7117668.

16   Wu KK, Chan SK, Ma TM. Posttraumatic stress after SARS. Emerg Infect Dis. 2005 Aug;11(8):1297-300. doi: 10.3201/eid1108.041083. PMID: 16102324; PMCID: PMC3320475.

17   Hatch R, Young D, Barber V, Griffiths J, Harrison DA, Watkinson P. Anxiety, Depression and Post Traumatic Stress Disorder after critical illness: a UK-wide prospective cohort study. Crit Care. 2018 Nov 23;22(1):310. doi: 10.1186/s13054-018-2223-6. PMID: 30466485; PMCID: PMC6251214.

18   Xi Y, Yu H, Yao Y, Peng K, Wang Y, Chen R. Post-traumatic stress disorder and the role of resilience, social support, anxiety and depression after the Jiuzhaigou earthquake: A structural equation model. Asian J Psychiatr. 2020 Mar;49:101958. doi: 10.1016/j.ajp.2020.101958. Epub 2020 Feb 11. PMID: 32078953.

19   Baker B, Yang I. Social media as social support in pregnancy and the postpartum. Sex Reprod Healthc. 2018 Oct;17:31-34. doi: 10.1016/j.srhc.2018.05.003. Epub 2018 May 21. PMID: 30193717.

20   DeHoff BA, Staten LK, Rodgers RC, Denne SC. The Role of Online Social Support in Supporting and Educating Parents of Young Children With Special Health Care Needs in the United States: A Scoping Review. J Med Internet Res. 2016 Dec 22;18(12):e333. doi: 10.2196/jmir.6722. PMID: 28007689; PMCID: PMC5216258.

21   Stevens M, Cruwys T, Murray K. Social support facilitates physical activity by reducing pain. Br J Health Psychol. 2020 Sep;25(3):576-595. doi: 10.1111/bjhp.12424. Epub 2020 May 5. PMID: 32369263.

22   Uchino BN, Trettevik R, Kent de Grey RG, Cronan S, Hogan J, Baucom BRW. Social support, social integration, and inflammatory cytokines: A meta-analysis. Health Psychol. 2018 May;37(5):462-471. doi: 10.1037/hea0000594. Epub 2018 Mar 22. PMID: 29565600.

23   Christenfeld N, Gerin W. Social support and cardiovascular reactivity. Biomed Pharmacother. 2000 Jun;54(5):251-7. doi: 10.1016/S0753-3322(00)80067-0. PMID: 10917462.

24   Akdag Topal C, Terzioglu F. Assessment of depression, anxiety, and

social support in the context of therapeutic abortion. Perspect Psychiatr Care. 2019 Oct;55(4):618-623. doi: 10.1111/ppc.12380. Epub 2019 Apr 20. PMID: 31004351.

25   García-Torres F, Jacek Jabłoński M, Gómez Solís Á, Moriana JA, Jaén-Moreno MJ, Moreno-Díaz MJ, Aranda E. Social support as predictor of anxiety and depression in cancer caregivers six months after cancer diagnosis: A longitudinal study. J Clin Nurs. 2020 Mar;29(5-6):996-1002. doi: 10.1111/jocn.15123. Epub 2020 Jan 14. PMID: 31793095.

26   Monistrol-Mula A, Felez-Nobrega M, Domènech-Abella J, Mortier P, Cristóbal-Narváez P, Vilagut G, Olaya B, Ferrer M, Gabarrell-Pascuet A, Alonso J, Haro JM. The impact of COVID-related perceived stress and social support on generalized anxiety and major depressive disorders: moderating effects of pre-pandemic mental disorders. Ann Gen Psychiatry. 2022 Feb 14;21(1):7. doi: 10.1186/s12991-022-00385-3. PMID: 35164779; PMCID: PMC8845272.

Table 1

Characteristics of participants according to GAD-7 score, represented by Medians and Interquartile Range (IQR).

Variable	Total (n=655)	GAD-7 score < 9 (n=585)	GAD-7 score ≥ 9 (n=70)	p value
Age (year)	30 (26 – 47)	31 (26 – 49)	27 (23 – 33)	<0.001
Gender				0.007
male	246 (37.6%)	230 (39.3%)	16 (22.9%)	
female	409 (62.4%)	355 (60.7%)	54 (77.1%)	
Number of children				0.008
zero	392 (59.8%)	336 (57.4%)	56 (80.0%)	
one	37 (5.6%)	34 (5.8%)	3 (4.3%)	
two	95 (14.5%)	91 (15.6%)	4 (5.7%)	

three	100 (15.3%)	94 (16.1%)	6 (8.6%)	
four	31 (4.7%)	30 (5.1%)	1 (1.4%)	
Education				0.003
without diploma	23 (3.5%)	21 (3.6%)	2 (2.9%)	
12 years or less	125 (19.1%)	102 (17.4%)	23 (32.9%)	
B.A.	295 (45.0%)	260 (44.4%)	35 (50.0%)	
M.A. (or higher)	187 (28.5%)	178 (30.4%)	9 (12.9%)	
Other	25 (3.8%)	24 (4.1%)	1 (1.4%)	
Socio-economic status				<0.001
Low	21 (3.2%)	16 (2.7%)	5 (7.1%)	
Low-average	79 (2.1%)	60 (10.3%)	19 (27.1%)	
Average	281 (42.9%)	252 (43.1%)	29 (41.1%)	
Average-high	224 (34.2%)	209 (35.7%)	15 (21.4%)	
High	50 (7.6%)	48 (8.2%)	2 (2.9%)	
Occupation				0.029
Full-time job	280 (42.7%)	261 (44.6%)	19 (27.1%)	
Partially employed	109 (16.6%)	90 (15.4%)	19 (27.1%)	
Unpaid vacation	4 (0.6%)	4 (0.7%)	0 (0.0%)	
Lost job	33 (5.0%)	31 (5.3%)	2 (2.9%)	
Unemployed	55 (8.4%)	47 (8.0%)	8 (11.4%)	
Retired	174 (26.6%)	152 (26.0%)	22 (31.4%)	
Exercise				0.112
Yes	190 (29.0%)	164 (28.0%)	26 (37.1%)	
No	465 (71.0%)	421 (72.0%)	44 (62.9%)	
History of depression				<0.001
Yes	538 (82.1%)	494 (84.4%)	44 (62.9%)	
No	117 (17.9%)	91 (15.6%)	26 (37.1%)	
Use of				0.001

antidepressants

Yes	563 (86.0%)	512 (87.5%)	51 (72.9%)
No	92 (14.0%)	73 (12.5%)	19 (27.1%)
MSPSS score	6.08 (5.25 – 6.67)	6.08 (5.33 – 6.75)	5.75 (4.67 – 6.50)	0.009
GAD-7 score	3 (1 – 6)	3 (1 – 5)	13 (11 – 15)	<0.001

MSPSS, the Multidimensional Perceived Social Support; GAD-7, 7-item Generalized Anxiety Disorder Questionnaire

Table 2

Associations of GAD-7 score with MSPSS score (Regression coefficient and 95% confidence intervals).

Variable	Univariate Linear Regression		Multivariate Linear Regression	
	β (95%CI)	P value	β (95%CI)	P value
MSPSS	-0.692(-0.990, -0.394)	<0.001	-0.779(-1.063, -0.496)	<0.001
Age	-0.056(-0.077, -0.035)	<0.001	-0.048(-0.068, -0.028)	<0.001
Sex	1.888(1.246, 2.529)	0.316	1.641(1.021, 2.261)	<0.001
Number of children	-0.524(-0.760, -0.289)	<0.001	-	-
Education	-0.399(-0.763, -0.034)	0.032	-	-
Occupation	0.142(-0.006, 0.289)	0.059	-	-
Socio-economic status	-0.952(-1.300, -0.603)	<0.001	-0.514(-0.854, -0.174)	0.003
Exercise	-0.460(-1.162, 0.241)	0.198	-	-
Use of antidepressants	2.589(1.781, 3.397)	<0.001	2.046(1.279, 2.813)	<0.001

Table 3

Odds ratios (95% confidence intervals) of anxiety (GAD-7 score ≥ 9) across MSPSS score.

| Variable	Univariate Logistic Regression		Multivariate Logistic Regression	
	OR (95%CI)	P value	OR (95%CI)	P value
MSPSS	0.747(0.605, 0.921)	0.006	0.709(0.563, 0.894)	0.004
Age	0.965(0.944, 0.986)	0.001	0.976(0.953, 0.999)	0.041
Sex	2.187(1.222, 3.913)	0.008	2.151(1.142, 4.053)	0.018
Number of children	0.658(0.514, 0.842)	0.001	-	-
Education	0.617(0.464, 0.822)	0.001	0.615(0.445, 0.851)	0.003
Occupation	1.096(0.980, 1.227)	0.109	-	-
Socio-economic status	0.539(0.409, 0.710)	<0.001	0.628(0.465, 0.849)	0.003
Exercise	0.659(0.393, 1.106)	0.114	-	-
Use of antidepressants	2.613(1.461, 4.672)	0.001	2.588(1.384, 4.841)	0.004
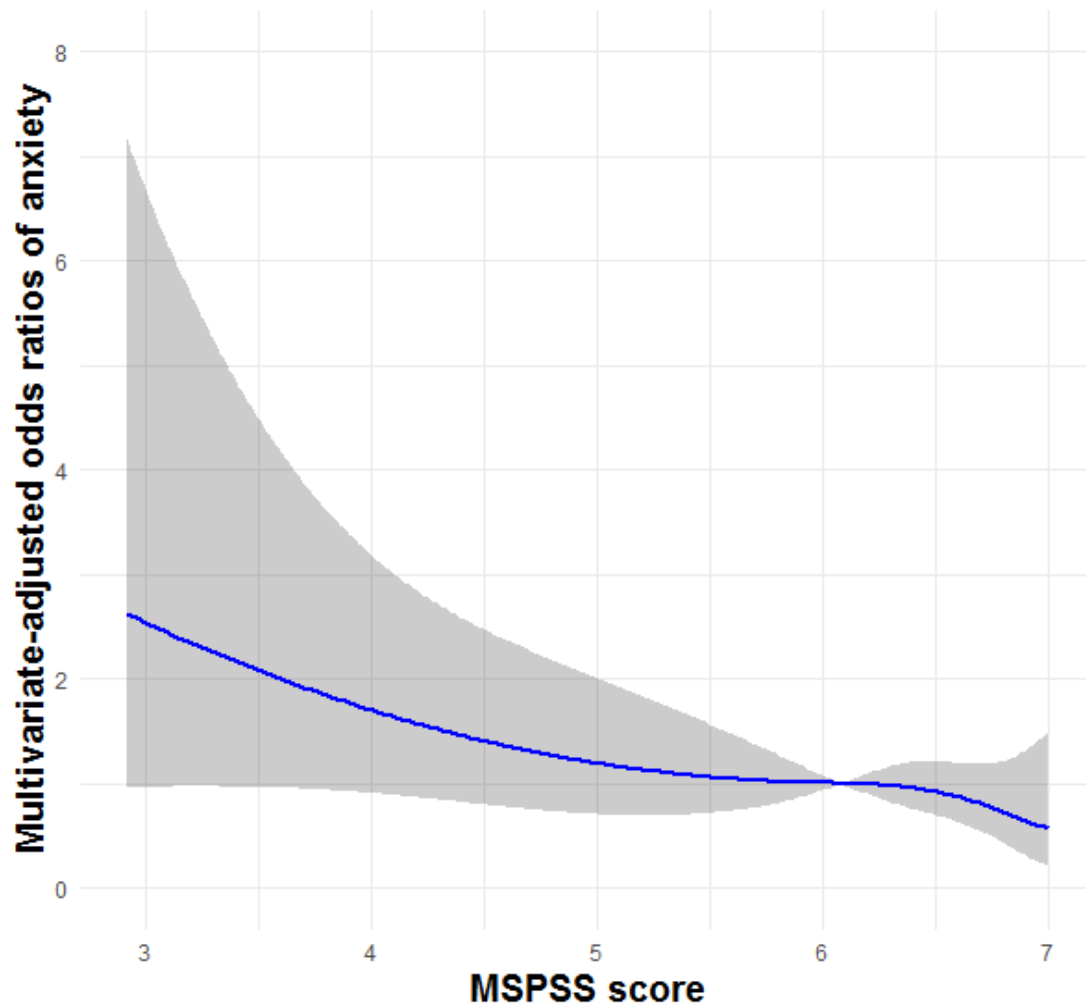
Figure 1. A restricted cubic spline model of the odds ratio between anxiety (GAD-7 score ≥ 9) and MSPSS score. The gray area represents a 95% confidence interval. Adjusted for age, gender, number of children, education, socio-economic status, occupation, exercise, history of depression and use of antidepressants.