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PSYCHOLOGICAL EFFECTS OF THE COVID-19 PANDEMIC IN NORTH CYPRUS: A POPULATION-BASED NATIONWIDE STUDY

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Summary

Background: *While the initial wave of the COVID-19 pandemic was controlled much better in North Cyprus, the number of cases saw a rapid increase as of November 2020. Local authorities implemented further restrictions with a second lockdown across the country to bring the cases under control. The present study aims to identify the potential predictors of COVID-19 related obsessions of adults during the second lockdown.*

Subjects and Methods: *This is a descriptive survey conducted with 652 participants over the age of 18. The Obsession with COVID-19 Scale, Coronavirus Anxiety Scale, and a Demographic Information Form were used to obtain information. Data were analyzed using SPSS and Spearman's Rho was calculated to examine existing relationships between COVID-19 anxiety and other research variables. A linear regression analysis was conducted to identify potential predictors of COVID-19 related obsessions.*

Results: *Participants infected with the COVID-19 virus had higher levels of anxiety and obsessions than those who weren't. The sample multiple correlation coefficient was .66, indicating that approximately 43% of the variance of the COVID-19 related obsessions was accounted for by the linear combination of strength measures. As expected, anxiety, positively and being infected with COVID-19 negatively predicted COVID-19 related obsessions.*

Conclusion: *The similarities and differences of the findings were compared with the results from the literature, yet the relationship between variables was identified to be higher when compared to similar studies.*

Keywords: *Anxiety, Obsessions, COVID-19 Pandemic, North Cyprus*

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INTRODUCTION

It has been over two years since the world met with the COVID-19 pandemic, which is still a threat. While initial data, between March 2020 – January 2021, pointed to a total of 92 million cases with COVID-19 related deaths up to 2 million, by July 2021, both of these figures had doubled (World Health Organization 2021).

North Cyprus, located on a small island in the Mediterranean Sea, has a population of approximately 300,000, implemented strict border control measures, which effectively closed off the entire country after the first COVID-19 case, which was seen in March 2020. During the implementation of the first lockdown, individuals were allowed to go out and get their needs for food and basic provisions, seek help for urgent healthcare, and continue with their farming activities. The first wave of pandemic was surpassed with low number of cases mainly due to the timely measures taken by the government.

However, in November 2020, the local government employed less strict border-control measures, allowing the entrance of passengers who would travel for a short period without any quarantine measures. Consequently, the number of local cases increased dramatically and the pandemic hospital and quarantine centers had to work beyond full capacity. Subsequently another lockdown was re-imposed across the country. The total number of cases detected in the country until the second lockdown was 3192, and the number of daily cases was averaged at 60 by the end of January 2021 (TRNC Ministry of Health 2021).

Pandemics affect physical and mental health (Choi et al. 2020). According to WHO (2022), many countries have completed prevalence surveys pertaining to the mental health consequences of COVID-19, which have suggested that COVID-19 led to an approximate 25% increase in people's anxiety levels. Based on this report, this data can be considered as the *"tip of an iceberg"*.

Like the Swine Flu (Brand et al. 2013) and Ebola (Blakey et al. 2015) viruses, significant associations between anxiety and obsessive symptoms were observed during COVID-19 (American Psychological Association 2020; Fineberg et al. 2020). Even though vaccines have been developed to reduce the risk of disease, the uncertainty surrounding viruses and the fact that they can

mutate are among the various reasons as to why many people continue to experience anxiety associated with viruses (Moghanibashi-Mansourieh 2020). High levels of contamination related anxiety, which may cause an unwanted, persistent and perpetual need for constant washing and hygiene, can be classified under the obsessive compulsive disorder diagnostics as specified in the DSM-5 (Ji et al. 2020). In addition to how the virus spreads, its lethality could also increase anxiety and obsessions regarding COVID-19 in individuals (Arrowood & Cox 2020; Aqeel et al. 2020; Kontoangelos et al. 2020; Pyszczynski et al. 2020; Shuja 2020).

Many studies have reported that constant exposure to news regarding COVID-19 and related death have led to an increase in people's anxiety and obsessions about COVID-19 (Joaquim et al. 2021; Shamir et al. 2021; Tsoy et al. 2021; Chen et al 2022). On the contrary, the same relationship wasn't found with regards to death news in another study (Silva et al. 2021). According to this, whether people consciously believe that the virus is a major threat to life or just a minor inconvenience, the fear of death plays an important role to modulate attitudes and behaviors associated with the virus (Breen et al. 2021).

Evidence pertaining to the associations of the COVID-19 pandemic, public health measures and mental health is limited in North Cyprus. Nevertheless, Turkish Cypriots have shown similar psychological effects, such as anxiety-related behaviors. There are two published studies about the psychological effects of COVID-19 in North Cyprus; one of them compares social media usage with anxiety (Kaya 2020), and the other is a review of the Turkish Cypriot's lockdown situation because of COVID-19 and their traumatic history (Volkan & Volkan 2020). With this in mind, this study will contribute both to the literature on pandemic studies and to future studies on a country basis.

Ever since the pandemic started, many researchers have studied people's anxiety levels and reached similar results (Huang & Zhao 2020; Mrklas et al. 2020; Solomou & Constantinidou 2020)2019. We aimed to assess the mental health burden of Chinese public during the outbreak, and to explore the potential influence factors. Using a web-based cross-sectional survey, we collected data from 7,236 self-selected volunteers assessed with demographic information, COVID-19 related knowledge, generalized anxiety disorder (GAD. A meta-analysis study found the prevalence of anxiety levels to be 31.9% (Salari et al. 2020). According to a study in China, nearly 10% of the participants were found to show symptoms of anxiety, with the older participants manifesting higher levels (Zhu et al. 2020). Another study in Belgium, France, and Canada, a significant percentage of participants reported feeling anxious due to the uncertainty of the COVID-19 pandemic (Glowacz & Schmits 2020). These prevalence studies point towards a trend of increasing anxiety levels among individuals, within the context of the COVID-19 pandemic, which is understandable.

In addition to the prevalence studies on people's anxiety levels, the existing literature on situational factors related to COVID-19, such as the duration of the lockdown periods and whether or not individuals contracted the virus, were examined for their potential impact on the levels of anxiety experienced. Rehman et al. (2021) conducted a study in India and found that people who lacked sufficient supplies to sustain the lockdown were the most affected and economic status was identified to be negatively correlated with stress and anxiety. Wang et al. (2020) conducted a study where 75% of the participants were observed to be worried whether their families would be infected with the virus and the results reflected a significant relationship between the level of anxiety and contracting COVID-19.

With anxiety studies, it is necessary to examine how COVID-19 related obsessions are also affected. The necessity of washing hands, wearing masks, and consistently following social distancing rules to reduce the risk of transmission are examples that fully correspond with the underlying dynamics of obsessions (Fontelle & Miguel 2020). Furthermore, obsessions are also closely related to the anxiety levels, since anxiety regarding disease contraction could lead to an increase in obsessions. While some studies examine the obsession levels of already diagnosed people (Davide et al. 2020; Khosravani et al. 2021; Tanir et al. 2020), there are relatively fewer studies examining COVID-19 related obsessions in daily life. (Chakraborty & Chatterjee 2020; Srivastava et al. 2020).

A study from 31 cities in India analyzed anxiety, obsession and fear levels related to COVID-19 and identified that half of the participants had mental health problems, and a significant positive relationship was found between fear, anxiety and COVID-19 related obsessions (Srivastava et al. 2020). Parallel with other studies, Mejeed et al. (2021) found a significant positive relationship between anxiety and COVID-19 related obsessions. Knowles and Onalurji (2021) found that the participants' obsessive handwashing behaviors increased compared to pre-COVID-19, and anxiety and protective behaviors increased respectively. However, obsessive-compulsive washing symptoms didn't significantly predict coronavirus-related anxiety. Bahçecioğlu Turan et al. (2021), found that there was a positive significant relationship between obsessions, helpless approach and submissive approach, and a negative significant relationship between

obsessions and self-confidence. Unlike the positive correlational relationship between anxiety and COVID-19 related obsessions have been observed across the literature predictive analyses between the two variables indicate conflicting results. At this point, it can be suggested that COVID-19 related obsessions are different from the obsessions found in the diagnostics criteria for obsessive-compulsive disorder (OCD). Hence in OCD, the repeated misinterpretation of intrusive thoughts leads to the development of the obsessions and since the thoughts are overly distressing, the individual engages in compulsive behavior trying to resist, block, or neutralize the obsessive thoughts. Therefore, it can be safe to say that obsessions and compulsions compose a vicious circle that feeds each other. However, in COVID-19, the sense of danger is outside and real unlike OCD. Consequently, predictive analyzes may not lead to results as expected from prior research.

Studies on anxiety and obsessions related to COVID-19 suggest that these two concepts are related. Further studies conducted during the COVID-19 period point to important results regarding the effects of contracting COVID-19 with regards to anxiety. Milman et al. (2022) revealed that contracting COVID-19 increases anxiety, and an infection or loss of a loved one also increases obsessions in addition to anxiety. Studies in Italy (Fioravanti et al. 2022) and Denmark (Sønderskov et al. 2021) observed that, unlike in the first wave, the psychological symptoms of individuals increased in the second wave of the pandemic. In both studies, the increase in psychological symptoms after the first lockdown may be associated with the fact that some precautions had to be extended despite the ongoing spread of infection.

In North Cyprus, the first wave ended with only 4 cases due to stringent lockdown rules and in November 2020, the cases increased dramatically because of a much more lenient approach. Since the increase in contamination may be related to the fact that individuals do not feel safe about getting infected with COVID-19, it was debated on whether or not to include individuals had been infected with COVID-19 in the study. The literature review revealed that there was a need to examine the psychological effects of COVID-19 in individuals since there was no study on this subject matter in North Cyprus. The present study aims to identify potential predictors for obsessions regarding COVID-19 in a large sample of adults during the second lockdown in North Cyprus. We explored the novel hypothesis that individuals with higher anxiety levels would have higher obsessions about COVID-19. It was also assumed that contracting COVID-19 might also affect anxiety levels regarding the virus.

SUBJECTS AND METHODS

Research Model

The present study examined the relationship between COVID-19 related obsessions and anxiety levels among Turkish Cypriots, while checking COVID-19 related anxiety and COVID-19 infection status. In this context, this study uses a descriptive research survey model. A survey allows to determine and examine the current situation of a group according to its various characteristics (Sönmez & Alacapınar 2014; Büyüköztürk et al. 2017). Although a cause and effect relationship isn't sought in this study, the data obtained from the present study will provide insight about potential future research questions (Stimson 2014).

Population and Sample

The population consists of individuals over the age of 18 living in North Cyprus. According to the last census reports for North Cyprus in 2011, there are a total of 195000 individuals over the age of 18 (TRNC Statistical Institute 2011). The sample size for this study was calculated with where at least 598 participants were needed with a 95% reliability rate (Krejcie & Morgan 1970; Tabachnick & Fidell 2012). A snowball sampling method (Sönmez & Alacapınar 2014) was used. 660 electronic questionnaires were shared with individuals via the internet to achieve the calculated target sample size. 655 questionnaires were returned, but three of them had incomplete data. Hence, the data of 652 participants (466 females and 186 males) were considered valid and used in further statistical analyses. Table 1 shows the descriptive data for participant's demographic information.

Research Instruments

The Obsession with COVID-19 Scale, Coronavirus Anxiety Scale, and a Demographic Information Form were used to collect data.

The Obsession with COVID-19 Scale (OCS)

The scale was developed by Lee (2020a) and adapted to Turkish by Evren et al. (2020) Obsession with COVID-19 Scale (OCS to measure persistent and disturbing thoughts about COVID-19. The scale is a one-dimensional scale with 4 items such as *"I couldn't stop thinking about the coronavirus"* and *"I dreamed about coronavirus".* The scale is a five-point Likert-type scale ranging from selections of none (0) to almost every day (4). A total score above 7 on the scale indicates dysfunctional thinking associated with coronavirus. The reliability coefficient of

the original and the Turkish scale version was found as 0.84 and 0.71, respectively.

Coronavirus Anxiety Scale (CAS)

This scale was developed by Lee (2020b) and adapted to Turkish by Evren et al. (2020) Obsession with COVID-19 Scale (OCS and aims to determine dysfunctional anxiety associated with the coronavirus crisis. The scale is a one-dimensional scale consisting of 5 items such as *"I had trouble falling or staying asleep because I was thinking about the coronavirus."* and *"I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus."*. The scale uses a five-point Likert-type scale with responses ranging between none (0) and almost every day (4). A total score above 9 on the scale indicates high anxiety associated with coronavirus. The reliability coefficient of the original and the Turkish scale was found as 0.93 and as 0.80, respectively.

Demographic Information Form

The researcher(s) developed the Demographic Information Form to obtain demographic characteristics of the participants. The form includes questions about age, gender, city of residence and COVID-19 infection status.

Obtaining Required Permissions

Ethics committee approval was obtained from Cyprus International University Ethics Committee. Participants were given the informed consent before administering the surveys. Participants were given information regarding the purpose of the present study, conditions of participation and their right to withdraw from the study at any point.

Collection of Data

The data collection process was carried out using Google Forms due to the ongoing COVID-19 pandemic. The survey announcement was made through social networking sites and applications such as Facebook and WhatsApp. Data were collected between February 18-25, 2021.

STATISTICAL ANALYSIS

The data were analyzed using SPSS 21. Initial statistical analysis consisted of data distribution in terms of normality, validity and reliability of the scales. As there was a skewed distribution, non-parametric tests were applied to compare participants scores based on their descriptive and demographic characteristics. Spearman's Rho was used to examine existing correlations between COVID-19 anxiety and the other research variables. A multiple regression analysis was conducted to test factors predicting anxiety level and COVID-19 infection and obsessions with COVID-19. Therefore, the independent variables for this study were people's COVID-19 infection status and anxiety level, and the dependent variable was the level of obsessions with COVID-19.

RESULTS

To analyze data normality, a Kolmogorov-Smirnov test was conducted on CAS and OCS, D (652) =.33 and D (652) =.17 to determine whether the data had a normal distribution respectively. The QQ plot was evaluated for CAS and OCS and it was concluded that the data didn't show a normal distribution, since the skewness and kurtosis values of the distribution weren't within the range of -1.5 and +1.5 (Tabachnick & Fidell 2012). Next, validity and reliability values for both scales were calculated. For validity, the Kaiser-Meyer-Olkin coefficients of CAS and the OCS were found to be .83 and .75, respectively; and Barlett's sphericity test results were calculated as χ^2 (10) = 2230.797; p <0.001 for CAS and χ^2 (6) = 930.653; p <0.001 for OCS. Cronbach Alpha internal consistency coefficients of the scales were calculated as .90 for CAS and .79 for OCS and were accepted as reliable since they were over .70 (Ahmed et al. 2020; Caycho-Rodríguez et al. 2021; Choi et al. 2020). Next analyses consisted of examining participant scores from the scales according to their demographic characteristics.

Mann Whitney U tests were conducted to evaluate the hypothesis that infected people's scores were higher than the people who had not contracted COVID-19, which can be seen in Table 2. Test results obtained were in the expected direction and found to be significant, z= -2.24, p<.05 for CAS and z= -3.78, p<.01 for OCS. According to these results, infected people had an average rank of 399.79 for CAS and 459.50 for OCS. Findings suggest that people who were infected with COVID-19 had higher levels of anxiety and obsessions when compared to those who weren't infected.

The relationship between obsessions about COVID-19 and other variables were tested using Spearman's Rho correlation coefficient, which can be found in Table 3. COVID-19 obsessions were positively correlated with COVID-19 anxiety. However, a significantly negative correlation was found between obsessions with COVID-19 and getting infected.

A multiple regression analysis was performed to evaluate how well COVID-19 anxiety level and COVID-19 infection status predicted obsessions about COVID-19. The linear combination of anxiety level and getting infected with COVID-19 was predicted to obsessions, $F(3,645)=166.11$, $p<.01$. The sample multiple correlation coefficient was .66, indicating that approximately 43% of the variance of the COVID-19 with obsessions in the sample could be accounted for by the linear combination of strength measures. Pursuant to Table 4, three variables predicted the significance of obsessions about COVID-19 among the predictor variables: Anxiety level about COVID-19, and getting infected. As expected, anxiety levels about COVID-19 have positive and meaningful associations ($\beta=0.61$, $p<0.01$), whereas getting infected negatively predicted COVID-19 anxiety ($\beta=-0.15$, $p<0.01$, and $\beta=-0.10$, $p<0.00$, respectively). Table 4 also shows that the values for the two indices of tolerance and variance inflation factor (VIF) are in the appropriate ranges as proposed by Tabachnick and Fidell (2012), which suggests that there are no multicollinearity issues in relation to the variables in the regression analysis.

DISCUSSION

The present study aimed to identify the predictors for obsessions about COVID-19 during the second lockdown in North Cyprus. Pandemic mental health studies address issues such as fear and anxiety related to COVID-19 (Kumcağız & Göksu 2020, Shuja et al. 2020). Initial studies were conducted with specific groups such as high-risk healthcare workers and infected individuals (Fioravanti et al. 2022, Fountoulakis et al. 2021, Moayed et al. 2021, Tan et al. 2020) and the general population (Das et al. 2021) where such prevalence studies revealed increased levels of anxiety and distress in individuals. Wu et al. (2021) conducted a meta-analysis study and observed that the anxiety rates in individuals during the COVID-19 period differed between 6.3% and 87.5%.

There have also been mental health studies that focused on individuals diagnosed with OCD during the pandemic (Guzick et al. 2021; Jelinek et al. 2021, Wheaton et al. 2021) and the obsessions about COVID-19, which is the unspoken part of COVID-19 pandemic. Therefore, obsessions related to COVID-19 were included in our study to understand the persistent thoughts that may be observed in individuals who do not have an OCD diagnosis. Protective rules were initiated as a must to be followed to avoid getting infected with COVID-19, which kept COVID-19 related thoughts alive. Al-Shatanawi et al. (2021) conducted a study concluding that students who were informed about COVID-19 had higher obsession levels. Another cross-sectional study conducted in Canada showed that nearly 60% of the participants' obsession levels increased because of COVID-19 (Abba-Aji et al. 2020).

As seen in the regression analysis, the level of anxiety about COVID-19 leads to a significant and positive prediction of obsessions with COVID-19. Studies in the literature indicate a strong relationship between the pandemic and anxiety (Kar & Bastia 2006; Liu et al. 2020; WHO 2022). In studies on previous pandemic threats, obsessive symptoms of outbreaks were identified to be connected with anxiety (Brand et al. 2013; Wheaton et al. 2010; Wheaton et al. 2012), and similar findings have also been found in studies on COVID-19 (McKay et al. 2020; Wheaton et al. 2021). Therefore, in addition to the compliance obligations with hygiene rules along with consistent and regular physical distancing to minimize the risk of infection, it can be interpreted that the spreading pattern of the virus triggers anxiety and therefore individuals may feel the necessity to employ precautionary safety behaviors

Due to the uncontrolled increase in local contamination rates, the present study examined whether the anxieties and obsessions of the individuals on this issue differed according to whether they had previously contracted COVID-19. Although only 4% of the participants were previously infected, the results were found to be statistically significant and showed that the anxiety and obsession levels of individuals who had previously been infected with COVID-19 were higher than those who had not been infected. Despite the low proportion of infected participants, results may be related to the fact that North Cyprus was facing the effects of COVID-19. Although the lockdown started with strict rules following the first case in March 2020, local transmission started in North Cyprus in November 2020 and hospital units allocated for pandemic patients were filled in a very short time.

Findings obtained in the following studies also show parallel results with this study. In a study conducted by Samuels et al. (2021), supports a relationship between obsessions related to COVID-19 and getting infected with COVID-19. It was observed that the fear of negative consequences associated with the disease and anxiety regarding disease transmission to loved ones negatively affected the mental health of individuals who had a potentially fatal infection and who had to stay in quarantine in a hospital or a private facility (Desclaux et al. 2017; Jeong et al. 2016). In another study, the anxiety level was found to be higher in COVID-19 patients than in other individuals (Xu et al. 2020). De Pietri and Chiorri's (2021) found that inadequate quarantine conditions

and the inability to receive appropriate treatment, in the case of infection, affected individuals' anxiety levels. Our study concluded that having COVID-19 had a significant and negative predictive effect on their obsessions regarding COVID-19, which is different from the abovementioned studies. This can be interpreted as due to the fact that people infected in North Cyprus had the disease with mild symptoms during the first lockdown, and the effects of the pandemic weren't experienced at a severe level (such as a high mortality rates or high patient counts in intensive care), so obsessions related to the disease decreased.

Overall, our findings show that psychological factors are also effective in relieving anxiety caused by COVID-19 prevalence. Regression analysis results show that 43% of the variance in the obsessions variable with COVID-19 can be explained by the predictor variables. Although there are similar studies in the literature, it has been observed that obsessions with COVID-19 aren't considered as a dependent variable, and obsessions are examined as a predictor variable in studies (Brand et al. 2013; Wheaton et al. 2021). Knowles and Olatunji (2021) revealed that a fear of COVID-19 transmission and obsessive-compulsive washing symptoms didn't significantly affect coronavirus-related anxiety. Romero-Gonzalez et al. (2020) conducted a study with pregnant women and found that the age and fear of infection predicted the stress level of COVID-19 as 28%. According to Malesza and Kaczmarek (2021), the tendency of increased anxiety level by demographic characteristics (gender, age, chronical illness) was examined and predictive rate found to be 36%. In this study, unlike other studies, COVID-19 associated anxiety (loss of appetite, sleep problems) and the effects of getting infected with COVID-19 were examined respectively. In this context, we can say that our study findings have a higher predictive rate than the studies in the literature.

Like other studies, this study has some limitations. Due to the pandemic, the study had to be conducted over an online platform. As a result of this methodological choice, individuals who didn't use or have access to smartphones, computers, or tablets and/or didn't have any internet access could not participate in the study. Another limitation of the study is that it only covers individuals over the age of 18; therefore, it does not provide any data on children and adolescents. It is recommended that future studies focus on individuals without internet access, as well as children and adolescents who have faced COVID-19 with adults.

CONCLUSIONS

This study is the first to be conducted, on the mental health of individuals in North Cyprus, during the COVID-19 pandemic. It was aimed to investigate factors that seemed to be influential in arousing people's obsessions with COVID-19. As predicted, all of the main study variables were significantly associated with obsessions with COVID-19. It is thought that the results obtained during this timeframe, which was during the very first aggressive peak in North Cyprus where there was an increase in the number of cases and the local spread rate could not be controlled, will provide information pertaining to preventive mental health care to professionals in the field. Based on WHO's (2020), if protective measures, which facilitate and promote psychological well-being, are ignored as a result of COVID-19 individuals will likely experience psychological, social, and economic difficulties. However, it is hoped that the present results will contribute to the scientific research data in other countries and be seen as a starting point for studies in the North Cyprus.

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