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PSYCHOLOGICAL IMPACTS, RELATED STRESSOR AND COPING STRATEGIES OF THE COVID-19 PANDEMIC

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ABSTRACT: This research contains eclectic analyses of the impact of the COVID 19 pandemic on the stress and anxiety level along with the findings from the in-depth empirical research that identifies the related stressors and coping strategies. This study examined and identified the COVID 19 related stressors, resilience, and family support as predictors of psychological impacts among participants that differ in age, gender, place of living, the status of living, COVID 19 status, vaccine status, education, salary, and employment. Based on the findings, the researchers identified the Coronavirus Disease 2019 related stressor, Perceived Stress and Anxiety level, Family functioning, Resilience, and Coping strategies of the participants from North Macedonia. This web-based, cross-sectional study was conducted by using the set of questionnaires based on which the quantitative analyses on the different variables have been analyzed. By computing a multivariate linear model this paper presents the results of the relevant demographic factors, coping factors, and COVID 19 stress factors that contribute to the mental health impacts during the COVID 19 pandemic. Additionally, Corona 19 related stressors and coping factors were confirmed as predictors of psychological impacts identified by multiple regression analyses. The paper increases the knowledge of mental health professionals and the wider population in identifying risk factors and symptoms of mental stress, distress, and disorder from COVID 19 for better identification and management of the client's treatment. This practical approach should increase the awareness of the people about the importance of seeking support, mental health facilitation as well as counseling and psychotherapeutic services during pandemic situations. Reliable information, accessible services, and stronger collaboration between academic institutions, clinical work, and public health can be a suitable approach for mental health issues prevention and taking appropriate measures for coping with the psychological impacts on a long-term basis.

KEYWORDS: *stress, anxiety, COVID-19, resilience, coping strategies*

INTRODUCTION

The SARS Cov-2 pandemic has caused enormous limitations and changes in people's daily lives. Most of the changes that people have experienced and are still experiencing are related to the restrictive measures that have emerged globally, and although they are being relaxed just a few months ago, they have been far more drastic. Social distancing is a measure that scientifically most effectively prevents the spread of the virus. This measure was one of the most popular and is still implemented. This implies a drastic restriction of social activities. In addition to social distance, in many countries as well as in North Macedonia there is an active curfew. Although the existence of their effectiveness is indisputable, these measures leave the open question, contradiction, the insufficient trust of the population in the manner of their implementation, and the duration.

Many researchers (Cherie et al., 2020) at the very beginning of the pandemic warned about the potential risks that could arise, related to the deterioration of the psychological health of the population. Today it can be said with certainty that the pandemic has contributed to a significant increase in stress, anxiety, and fear in general among many people. The appearance of the virus, its mode of action and symptoms as well as the high mortality rate have an impact on the perception of people and their mental health. On the other hand, as an indirect consequence of the virus, the mentioned restrictive measures have a significant impact on the mental health of the population (García-Fernández et al., 2020). People are afraid for themselves, for their loved ones. Those who, due to their work commitment and the necessity of the work they do and who are most exposed to the danger of infection, have an increased risk of higher levels of stress and anxiety, fearing for themselves and their families. In addition, those that have not been diagnosed but have increased levels of stress and anxiety and reduced resilience should not be left out.

In the early stages of the COVID-19 pandemic, researchers stressed the importance of monitoring rates of depression, anxiety disorders, self-harm, and suicidal behavior in the general and vulnerable populations, including first-line health care workers (Hossain et al., 2020; Ayyala, Taylor & Callahan, 2020). Measures taken to mitigate the spread of the disease, such as quarantine, curfew, and social distance, have a negative impact on employment and the economy and increasing social isolation and loneliness. These stress factors are combined with fear of contracting the virus, experiences of grief, and uncertainty about the future. Given the adverse mental health outcomes that followed previous epidemics, the specific stressors, and the unprecedented degree of the COVID-19 health crisis, population-based studies began to emerge early in the pandemic (Modersitzki et al., 2020). One of the first studies on the psychological impact of the disease was a study by Vizheh et al. (2020) that measured PTSD, depression, anxiety, and stress. Immediately after the epidemic, more than half of the participants assessed the psychological impact of COVID-19 as moderate or severe. One-third reported moderate or severe anxiety symptoms, 17% reported depressive symptoms, and 8% reported moderate to severe stress. The same researchers repeated the surveys in the second study and although the PTSD scores were reduced, they were still above the clinically significant diagnostic range. Stress levels, anxiety, and depression remained the same for four weeks.

In the United Kingdom, the longitudinal analysis of adults was measured in three waves over six weeks. This study by O'Connor et al. (2020) found that across

all three-time points, levels of suicide, depression, and anxiety were much higher than established population norms. On average, approximately 1 in 4 adults reached the diagnostic thresholds for depression and anxiety compared with 1 in 20 compared to general population studies before COVID-19. Suicidal ideation was reported by 10% of the sample, compared to pre-COVID rates of 3%. Over time, suicidal ideation rates increased, anxiety decreased, and depression remained stable. On the other hand, a large study on self-realization in the United States, which measured the prevalence of psychological stress in adults in April 2020, provided a comparison with the results before COVID-19 in 2018. About 14% of respondents reported symptoms of severe psychological distress, an increase of 10% compared to the findings in 2018. Symptoms of anxiety were greater in younger adults, women, and those with the lowest household income (McGinty, et al., 2020). Studies inevitably point to the impact of the pandemic on the deteriorating mental health of the general population. In addition, several more important studies conducted during 2020 and early 2021 on a selected sample of respondents such as medical staff, retirees, children indicate increased levels of stress, depression, anxiety as a result of the pandemic (Hossain et al., 2020).

The term stress is often found not only in contemporary psychological, scientific and popular literature but also in publications from many other fields. It is used so often that it has taken on many different meanings. Stress is the subject of interest and research in various scientific disciplines from biological, psychological, to sociological sciences and in each area differs from what the term refers to (Aldwin, 1994). According to Lazarus (1993), different approaches to defining stress can be found in the literature. One of them is that stress is an internal state. According to this approach, stress is an internal state of the body that includes both physiological and emotional reactions. Research on physiological stress responses focuses on the peripheral and central nervous systems, as well as the functioning of the neuroendocrine and immune systems. Although in general, this approach is assuming that stress has a negative physiological effect, still stress has an activating effect that can be both positive and negative depending on the context. Emotional reactions to stress are usually associated with negative feelings such as anxiety, anger, and sadness, although stressful reactions can include shame, guilt, and boredom. The second approach determinates stress as an external condition. Throughout the history of stress, it was considered that stress can be caused by a harmful external stimulus that required a new form of adjustment from the person. The earliest stress studies focused on major traumas such as war and natural disasters. Later, interest spreads to major events in life, such as marriage, divorce, grief, dismissal, or employment. Some studies have researched and focused on the stressors of the physical environment such as noise, overcrowding, or pollution (Lazarus, 1996).

Another important approach defines stress as a result of a person's experience with the environment, especially those interactions in which there is a mismatch between personal resources and the demands of the environment. In modern psychology, this approach to stress research was created within cognitive psychology, prevails, and the main representative of that approach is R. Lazarus. Lazarus (1966) argues that psychological stress is always a link between the individual and the environment. According to him, stress always means a harmful transaction between a certain organism and a certain property of the environment. From Lazarus's point of view, by describing stress only as an external

event, we ignore individual differences in the perception or assessment of stress. What is stressful for one person at one time can not be stressful for another person, or even for the same person at another time point.

Anxiety disorder belongs to the so-called group Anxiety disorders and its main symptom is very pronounced, anxiety and worry. Worry and anxiety are related to many aspects of daily life such as health, work, finances, family, etc. Anxiety disorder is associated with many other psychiatric and somatic illnesses, often leaving it unrecognized. It leads to problems in daily functioning, affects the decline of quality of life, and can often lead to problems in interpersonal relationships. It can also have consequences for physical health, especially in the field of the cardiovascular system (Sartorius et al., 1996). Anxiety is one of the basic emotions and is generally equated with fear. This practice is not wrong, but it is important to note that despite the very clear commonalities between anxiety and fear, there are still some differences. What they have in common is that both emotions arise in situations where we feel that we are in danger. However, what fundamentally distinguishes them is that we use the term fear when it comes to estimating that danger is happening to us at the moment, while we use anxiety when we expect that danger to happen in the future. Therefore, we often describe anxiety as excitement, premonition, worry, or unpleasant anticipation that something bad will happen. It is difficult to control anxiety due to the uncertainty and unpredictability it brings (Bandelow et al., 2015).

The symptoms of mental stress are a significant component of anxiety disorder and can be presented as symptoms like irritability, difficulty concentrating and focusing attention, changed memory, and sleeping disorders. Patients are easily aroused and irritable, sometimes irritated by trifles, easily frightened - which is usually explained by the metaphors that they are "on the verge of breaking", that they are "like a tightrope" or "stuck rifle" "These difficulties are due to prolonged anxiety that intensifies the so-called "vigilance" of the central nervous system, which further leads to irritability and problems with the muscles, which are occasionally accompanied by pain in certain parts of the body (most commonly affected muscle groups on the back of the head, neck, shoulders, face, and eyelids) (Bandelow et al., 2015).

Psychological resilience explains the significant difference in psychological response that an individual has in a given situation and how different it is from another individual. Psychological resilience means a set of certain characteristics and protective factors that individuals have or do not have and allows them to overcome the hardships of life. Resistance is defined by personality traits and is a set of different characteristics that allow individuals to adapt to different stressful situations (Fletcher & Sakar, 2013). Every person can experience many accidents in their lifetime, from natural disasters, death of loved ones, terrorist attacks, serious or life-threatening illnesses or injuries, but there are significant inter-individual differences in immediate reactions and later life outcomes (Mancini & Bonanno, 2006). Some people develop psychopathological disorders, but most show resistance to the negative effects of stressful life events or recovery from initial anxiety.

Resilience is increasingly being explored in the field of mental health with recognized potential in promoting mental health, well-being, and quality of life, prevention of mental difficulties, and the process of recovery from mental illness. The construct of resistance is a turning point in psychology and

psychiatry, i.e. a change in the pathogenic paradigm, which is aimed at symptomatology, diseases, and disorders, according to the salutogenic paradigm focused on strengths, competencies, and adaptive outcomes (Windle, 2011). It has been found that the same risk factors for the development of psychiatric disorders do not necessarily lead to identical outcomes and life paths, which brings a new perspective in understanding psychopathology as well as the possibility of recovery from mental illness (Stainton et al., 2019). In that part, resilience is recognized as one of the key factors in the recovery process, which gives hope for clinical practice. However, awareness of resistance and its importance in clinical therapies is still minimal.

RESEARCH METHODOLOGY

By researching related individual, interpersonal and environmental stressors, resilience, and family support during the COVID 19 pandemic in total and in the subgroups (based on age, gender, place of living, status of living, education, salary, employment, COVID 19 status, vaccine status), the researchers aimed to measure the psychological impacts presented through stress, anxiety/depression levels. Additionally, the data analysis allows the interested parties to get new innovative knowledge for the coping strategies of the citizens in N. Macedonia. By using this data, the practitioners may enhance their transformative best practices in the field of mental health, as well as strengthen their capacities for the resilience of the population. From the other side, the wider population will be motivated and inspired to pay attention to their mental health and take all of the possible actions for self-care and care for others. The researchers conducted a cross-sectional online questionnaire survey to collect information on the psychological impacts of the COVID 19 eruption, resilience, family functioning, and stress coping strategies in N. Macedonia. The online questionnaire was distributed in April 2021, through a link with an exponential non-discriminative snowball sampling strategy. The link was first disseminated through the Facebook and Linkedin messaging platform as well as to the Facebook groups connected to mental health, psychological support, resilience, and COVID 19. People were encouraged to share the survey link on their profiles as well as to invite their friends to participate in the research. The questionnaire that is based on the transactional model of stress and adaptive coping was anonymous and contained a section for collecting participants' demographic characteristics (age, gender, place of living, status of living, education, salary, employment, COVID 19 status, vaccine status), stress factors during the COVID 19 pandemic (divided into three groups: individual, interpersonal and environmental), psychological impacts (stress level and level of anxiety/depression), resilience, family support and stress coping strategies. For every scale used in the questionnaire, reliability analyses were conducted. Additionally, the questionnaire was given to the pilot group of 50 participants that gave their feedback towards the understanding of the content, questions, and scaling of the items.

The COVID 19 stress factors were measured by using 12 items divided into three groups: individual factors (personal health, the health of family and friends, uncertainty, perception, and beliefs for COVID 19), interpersonal factors (online work/online school, internet/virtual communication, perception and beliefs for COVID 19, quarantine/police hours) and environmental factors (medical services, treatment, and availability, online work/online school, quarantine/police hours, support from the governmental institutions, relevant information related to COVID 19, safety and security of

the job places during COVID 19, social rights and services). By conducting reliability analyses the calculated Cronbach alpha for the questionnaire for measuring COVID 19 stress factors is 0.817. The level of stress was measured by using the Perceived Stress Scale (PSS-10, Cohen, Kamarck & Mermelstein, 1983) that contains 10 items that assess perceived stress during the past month. The calculated Cronbach's alpha of the adapted Macedonian version is 0.874. The symptoms of anxiety/depression were measured by using the Patient Health Questionnaire (Kroenke et al., 2009) that contains 4 items for detecting the symptoms of anxiety and depression. The calculated Cronbach's alpha of the adapted Macedonian version is 0.917. The functionality of the family system and the level of family support were measured by using the Brief Assessment of Family Functioning Scale (BAFFS, Abigail, Gabor & Thomas, 2018) that contains 3 items. The calculated Cronbach's alpha of the adapted Macedonian version is 0.713. The 10 items Connor-Davidson Resilience Scale (Connor & Davidson, 2003) was used for measuring the level of resilience of the Macedonian population. The calculated Cronbach's alpha of the adapted Macedonian version is 0.873. Finally, the coping strategies of the participants were measured by using the list of strategies that they have used the previous month to relax and adapt easily to the everyday challenges during the COVID 19 pandemic. The participants were able to choose as many strategies they are using during the last month. They were invited to add strategies that are not currently on the offered list (example: reading books, listening to music, watching TV/movies/series, talking with family members/friends/psychologist/religious person, sports activities, meditation, positive thinking, etc). The data analyses were conducted in SPSS for Windows (version 22).

The multivariate linear model was used to examine the differences in perceived stress level, anxiety and depression symptoms, level of resilience, and family support from COVID-19-related stressors (individual, interpersonal and environmental), among participants that differ in gender (2 groups), age (5 groups), education (5 groups), place of living (2 groups), status of living (3 groups), salary (5 groups), employment (2 groups), COVID 19 status (2 groups), vaccine status (2 groups). The differences in the severity of perceived stress ("low", "medium" and "high"), anxiety, and depression symptoms ("very low", "low", "medium" and "high"), in total and among different subgroups are presented as well. The correlation of mental health impacts with demographic factors, stress factors, and coping factors was examined using Person's correlation coefficients. Multiple linear regression was used to identify predictors of participant's psychological impacts. The dependent variables included perceived stress level and anxiety/depression symptoms. The demographic factors, COVID-19-related stressors, and coping factors were considered as independent variables influencing psychological impacts.

RESULTS

The online questionnaire was answered by 1048 participants. All of the received answers were included in the process of data analysis. From the 1048 participants (see Table 1) that answered the questionnaire 87.5% were female while 12.5% were male. Most of the participants 44.2% were from 36 to 45 years old, while 34.1% were aged from 26 to 36 years. Regarding education, 50.7% of the participants have graduated (Bachelor level), 21.9% have finished primary/secondary school, 6.2% are undergraduates, 16.8 have Master level and 4.4% have a Doctorate level. Most of them (92.1%) live in the urban area in nuclear families (75.9%) and are self-employed or employed (79%). The

35.3 participants earn more than 35.000 MKD per month, while 24.2% and 24.8% earn 15.001-25.000 and from 25.001-35.000 MKD. Most of the participants (70%) have not been diagnosed with COVID 19 while only 10.9% have been vaccinated. According to the analyses for determinating between-subjects effect (see Table 3), the demographic variables have been confirmed as significant but weak predictors (Adjusted R^2=7% for perceived stress level and AR^2=9% for anxiety/depression symptoms). Based on the analyses in every subgroup, significant results have been found in between-subject effects analyses for perceived stress level and gender (Adjusted R^2=2%), age (AR^2=2%), and salary (AR^2=4%). The significant results have been found for anxiety and depression symptoms and age (AR^2=3%), gender (AR^2=2%), the status of living (AR^2=1%), and employment status (AR^2=2%) as well.

The total level of stress factors- SF (individual-IN; interpersonal-IP and environmental-EN) is above the expected mean (SF, M=50.28, expected M=42.00), as well as the total results from each group (IN, M=15.02, expected M=12.00; IP, M=13.69, expected M=12.00; EN, M=21.57, expected M=21.00). The results (see Table 2) are showing that stress factors have received the highest results from the following subgroups: COVID 19 diagnosed participants (IN, M=15.17; IP, M=13.81), non vaccinated participants (IN, M=13.77; EN M=21.74); females (IN, M=15.29; IP, M=13.93; EN, M=21.90); age groups 26-35 years (IN, M=15.25; EN, M=21.68) and 18-25 years (IP, M=14.43); undergraduates (IN, M=15.38; EN, M=22.39) and participants with primary/secondary school (IP, M=14.05); participants that live in rural area (IN, M=15.73; IP, M=14.67; EN, M=22.35); participants that live in extended family (IN, M=15.29; IP, M=14.35; EN, M=22.40); participants that receive the salary below 10.000 MKD (IN, M=15.38; IP, M=14.56) and the group with salary 15.001-25.000 MKD (EN, M=22.61); as well as non-employed participants (IN, M=15.32; IP, M=14.11; EN, M=22.04). The relations of the COVID 19 stress factors and perceived stress level and anxiety/depression symptoms were tested by using multivariate linear analyses (between-subject effects, see Table 3). All three types of CORONA 19 pandemic stressors (IN, IR and EN) have been confirmed as significant predictors of perceived stress level (Adjusted R^2 =47%; IN AR^2=30%; IP AR^2=19; EN AR^2=28%) and anxiety/depression symptoms (AR^2=48%; IN AR^2=29%; IP AR^2=18; EN AR^2=22%) which confirms that the individual factors (personal health, the health of family and friends, uncertainty, perception, and beliefs for COVID 19) have the most important impact to stress and anxiety from all tested CORONA 19 stress factors, followed by environmental factors.

Regarding the severity of the perceived stress level-PSL (see Table 1) the most of the participants (51.6%) experience medium stress while 35.1% experience a high level of stress (total M=32.73, expected M=30.00). The results from the descriptive analyses for the severity of anxiety and depression symptoms-ADS present that most of the participants (42.4%) experienced a high level of ADS while 22.1% experience a medium level of ADS (total M=13.58, expected M=12.00). The level of PSL and ADS is higher in the non-diagnosed subgroup (PSL, M=32.77; ADS, M=13.63) as well as in the group of non-vaccinated participants (PSL, M=32.95; ADS, M=13.71). Female participants (PSL, M=33.14; ADS, M=13.85) are more stressed/anxious than males (PSL, M=29.91; ADS, M=11.69) while younger participants (18-25 years, PSL, M=35.42; ADS, M=15.86) are more stressed/anxious than older participants (56-75 years, PSL, M=28.02; ADS, M=10.63). Participants

with higher education (BA, PSL, M=32.18, ADS, M=13.12; M.Sc., PSL, M=32.14, ADS, M=13.30; Ph.D., PSL, M=29.78, ADS, M=12.30) are less stressed/anxious than participants with primary/secondary school (PSL, M=34.28, ADS, M=14.74) and undergraduates (PSL, M=34.78, ADS, M=14.74). Regarding the status of living, the most stressed/anxious group are people that leave in the extended family (PSL, M=33.99, ADS, M=14.29) while those that live in the rural area (PSL, M=35.10, ADS, M=14.95) are more stressed/anxious than those that live in the urban area (PSL, M=35.3, ADS, M=13.47). Participants that earn less (below 10.000 MKD, PSL, M=36.31, ADS, M=15.81; from 10.001-15.000 MKD, PSL, M=35.84, ADS, M=15.81) are more stressed/anxious compared with participants that earn more (more than 35.000 MKD, PSL, M=31.10, ADS, M=13.05). Non-employed participants (PSL, M=34.65, ADS, M=13.58) are more stressed than those that are self-employed or employed (PSL, M=32.22, ADS, M=13.58).

Table 1:

Levels and severity of psychological impacts from CORONA 19 pandemic in the total sample and subgroups

			Perceived stress level				Anxiety and depression symptoms				
	N Total: 1048	% of Total N	Mean±SD Total: 32.73±7.99	Low (%) Total: 13.1	Medium (%) Total: 51.6	High (%) Total: 35.3	Mean±SD Total: 13.58±4.93	Very low (%) Total: 14	Low (%) Total: 21.5	Medium (%) Total: 22.1	High (%) Total: 42.4
COVID 19 status											
Diagnosed	314	30	32.65±7.96	4.1	15.4	10.5	13.46±5.20	4.6	6.8	5.6	13
Non diagnosed	734	70	32.77±8.00	9	36.3	24.7	13.63±4.82	9.4	14.7	16.5	29.4
Vaccine status											
YES	114	10.9	30.96±7.43	1.6	6.5	2.8	12.58±4.86	2	2.5	2.7	3.7
NO	934	89.1	32.95±8.03	11.5	45.1	32.5	13.71±4.93	11.9	19.1	19.5	38.6
Gender											
M	131	12.5	29.91±8.00	3.1	6.4	3.1	11.69±4.66	2.6	3.8	3	3.1
F	917	87.5	33.14±7.91	10	45.2	32.2	13.85±4.92	11.4	17.7	19.2	39.2
Age											
18-25	92	8.8	35.42±7.74	0.6	4.1	4.1	15.86±4.47	0.2	1.6	1.5	5.4
26-35	357	34.1	32.70±8.14	4.5	17	12.6	13.55±4.96	4.8	7.3	7.5	14.5
36-45	463	44.2	32.98±7.70	5.2	23.5	15.5	13.69±4.87	6	9.4	10.1	18.7
46-55	87	8.3	31.38±7.89	1.3	4.5	2.5	12.41±4.78	1.6	1.9	1.8	3
56-75	49	4.7	28.02±7.97	1.5	2.4	0.7	10.63±4.54	1.3	1.4	1.1	0.8
Education											
Primary, Secondary	230	21.9	34.28±8.08	2.5	9.8	9.6	14.74±4.81	2.3	3.1	5	11.5
Undergraduate	65	6.2	34.72±6.97	0.5	2.8	2.9	14.94±4.80	0.5	1.2	1.1	3.3
Bachelor	531	50.7	32.18±7.87	6.9	27.4	16.4	13.12±4.93	7.9	12	11	19.8
Master	176	16.8	32.41±8.28	2.5	8.8	5.5	13.30±4.94	2.7	3.4	4.3	6.4
PhD	46	4.4	29.78±7.48	0.8	2.7	0.9	12.30±4.58	0.6	1.7	0.8	1.3
Place of living											
Rural	83	7.9	35.10±7.74	0.8	3.2	3.9	14.95±4.63	0.7	1	1.8	4.4
Urban area	965	92.1	35.3±7.98	12.3	48.4	31.4	13.47±4.94	13.3	20.5	20.3	38
Status of living											
Single or in a group with other people	73	7	31.01±8.85	1.3	3.5	2.2	12.04±5.32	1.4	2.1	1.4	2
Nuclear family	795	75.9	32.61±8.01	10.1	39.3	26.5	13.56±4.86	10	16.9	16.9	32.1
Extended family	180	17.2	33.99±7.35	1.6	8.8	6.7	14.29±4.99	2.5	2.6	3.8	8.3
Salary											
Below 10 000	85	8.1	36.31±7.80	0.6	3.2	4.3	15.81±4.23	0.2	1.6	1.1	5.2
10-15 000	79	7.5	35.84±8.12	0.5	3.1	4	15.39±4.75	0.7	1	1.3	4.5
15001-25000	254	24.2	33.56±7.94	2.8	11.4	10.1	13.82±4.96	3.4	4.6	5.5	10.7
25001-35000	260	24.8	32.15±7.26	2.8	14.7	7.3	12.83±4.70	3.8	6	6.4	8.6
more than 35000	370	35.3	31.10±8.03	6.5	19.2	9.5	13.05±5.0	5.8	8.3	7.7	13.5
Employment											
Self-employed/ Employed	828	79	32.22±7.87	11	42.5	25.5	13.18±4.93	12.6	17.9	18	30.5
Non-employed	220	21	34.65±8.12	2.1	9.1	9.8	13.58±4.93	1.4	3.6	4.2	11.8

Table 2:

Stress level from CORONA 19 pandemic related stressors, levels of resilience, and family functioning in the total sample and subgroups

		Individual factors	Interpersonal factors	Environmental factors	Resilience	Family support
	N Total: 1048	Mean±SD Total:15.02±3.31	Mean±SD Total: 13.69±3.73	Mean±SD Total: 21.57±4.76	Mean±SD Total: 34.86±8.1	Mean±SD Total: 12.21±2.79
COVID 19 status						
Diagnosed	314	15.17±3.30	13.81±3.56	21.47±4.49	34.84±8.30	12.16±2.84
Non diagnosed	734	14.95±3.32	13.64±3.80	21.61±4.87	34.87±8.01	12.23±2.78
Vaccine status						
YES	114	15.02±3.14	13.06±3.61	20.19±4.44	35.25±7.84	12.42±2.56
NO	934	15.02±3.34	13.77±3.74	21.74±4.77	34.82±8.13	12.18±2.82
Gender						
M	131	13.09±3.56	12.04±3.85	19.23±4.93	37.15±7.48	11.51±2.86
F	917	15.29±3.19	13.93±3.65	21.90±4.64	34.54±8.13	12.31±2.77
Age						
18-25	92	15.21±2.91	14.43±3.48	21.54±4.29	33.96±8.55	11.61±3.04
26-35	357	15.25±3.33	13.93±3.57	21.68±4.83	34.77±8.02	12.31±2.80
36-45	463	15.11±3.33	13.82±3.73	21.97±4.60	34.78±8.02	12.37±2.70
46-55	87	13.96±3.22	12.49±3.96	20.97±4.89	34.80±7.24	11.87±2.86
56-75	49	13.96±3.47	11.40±3.77	18.10±4.95	38.08±7.41	11.71±2.82
Education						
Primary, Secondary	230	15.04±3.53	14.05±4.31	21.89±5.24	34.56±8.92	11.80±3.08
Undergraduate	65	15.38±3.09	14.0±3.48	22.39±4.69	34.02±8.26	11.82±2.46
Bachelor	531	14.97±3.30	13.75±3.67	21.60±4.72	34.91±7.89	12.31±2.73
Master	176	15.11±3.18	13.20±3.26	21.26±4.31	35.17±7.67	12.48±2.60
PhD	46	14.54±3.17	12.50±3.02	19.71±3.85	35.91±7.51	12.75±2.70
Place of living						
Rural	83	15.73±3.23	14.67±3.79	22.35±4.50	33.69±9.07	11.34±3.16
Urban area	965	14.96±3.32	13.60±3.71	21.50±4.77	34.96±8.00	12.28±2.75
Status of living						
Single or in a group with other people	73	14.04±3.48	12.68±3.67	20.82±5.08	36.84±8.07	10.64±2.96
Nuclear family	795	15.05±3.32	13.63±3.71	21.45±4.79	34.87±8.02	12.43±2.67
Extended family	180	15.29±3.15	14.35±3.75	22.40±4.39	34.04±8.03	11.86±3.05
Salary						
Below 10 000	85	15.38±3.01	14.56±3.58	22.26±4.44	33.16±8.03	11.04±3.02
10-15 000	79	14.47±4.17	13.20±4.93	22.15±5.66	33.13±8.84	11.25±3.02
15001-25000	254	15.32±3.27	14.40±3.60	22.61±4.74	34.69±8.45	12.30±2.64
25001-35000	260	14.88±3.14	13.43±3.58	21.42±4.69	34.60±7.73	12.42±2.79
more than 35000	370	14.92±3.31	13.29±3.75	20.67±4.51	35.93±8.04	12.47±2.70
Employment						
Self-employed/ Employed	828	14.94±3.34	13.57±3.70	21.45±4.74	35.45±7.8	12.43±2.70
Non-employed	220	15.32±3.20	14.11±3.81	22.04±4.78	32.64±8.8	11.35±2.99

Table 2:

Stress level from CORONA 19 pandemic related stressors, levels of resilience, and family functioning in the total sample and subgroups

Dependent variable 1: Perceived Stress Level	Adjusted R2	F/df	P/Eta
Adjusted R2=56%			
1. Demographic variables	7%	5.51/19	0.00**/0.92
COVID 19 status	0%	0.13/1	0.71/0.00
Vaccine status	1%	1.62/1	0.20/0.00
Gender	2%	13.2/1	0.00**/0.01
Age	2%	4.90/4	0.00**/0.02
Education	1%	1.06/4	0.38/0.00
Place of living	1%	0.81/1	0.37/0.00
Status of living	1%	1.57/2	0.21/0.00
Salary	4%	4.45/4	0.00**/0.02
Employment	1%	1.92/1	0.16/0.00
2. COVID 19 Pandemic Stressors	47%	2.26/737	0.00**/0.84
Individual Stressors	30%	7.34/16	0.00**/0.27
Interperosonal Stressors	19%	1.97/16	0.01*/0.09
Environmental Stressors	28%	3.51/23	0.00**/0.20
3. Coping Factors	36%	3.05/291	0.00**/0.54
Reselience	36%	9.13/39	0.00**/0.32
Family support	6%	1.29/12	0.22/0.02
Dependent variable 2: anxiety/ depression level			
Adjusted R2=48%			
1. Demographic variables	9%	6.31/19	0.00**/0.10
COVID 19 status	0%	0.47/1	0.49/0.00
Vaccine status	0%	1.02/1	0.31/0.00
Gender	2%	19.10/1	0.00**/0.02
Age	3%	6.72/4	0.00**/0.03
Education	2%	1.74/4	0.14/0.01
Place of living	1%	0.26/1	0.61/0.00
Status of living	1%	2.99/2	0.05*/0.01
Salary	3%	1.90/4	0.11/0.01
Employment	2%	6.24/1	0.01*/0.01
2. COVID 19 Pandemic Stressors	48%	2.31/737	0.00/0.085
Individual Stressors	29%	7.79/16	0.00**/0.29
Interperosonal Stressors	18%	2.63/16	0.00**/0.12
Environmental Stressors	22%	2.32/23	0.00**/0.15
3. Coping Factors	25%	2.20/291	0.00**/0.46
Reselience	29%	5.98/39	0.00**/0.24
Family support	6%	1.51/12	0.11/0.02

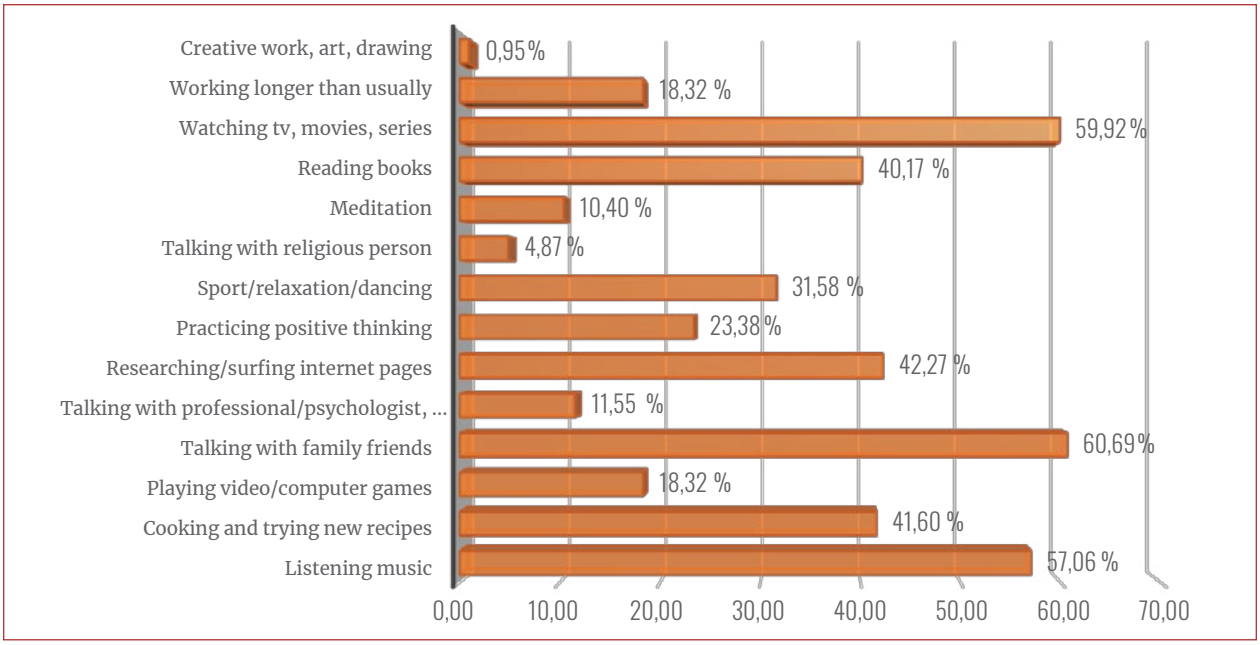
Table 4:

Associations between psychological impacts and CORONA 19 related stressors and coping factors

		PSL	ADS	Family support	Resilience	Individual factors	Interpersonal factors	Environmental factors
PSL	Pearson Correlation	1	.802**	-.244**	-.599**	.553**	.436**	.532**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
ADS	Pearson Correlation	.802**	1	-.252**	-.537**	.542**	.426**	.468**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
Family support	Pearson Correlation	-.244**	-.252**	1	.245**	-0.03	-.072*	-0.055
	Sig. (2-tailed)	.000	.000		.000	0.327	0.02	0.074
Resilience	Pearson Correlation	-.599**	-.537**	.245**	1	-.415**	-.278**	-.339**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
Individual factors	Pearson Correlation	.553**	.542**	-0.03	-.415**	1	.548**	.589**
	Sig. (2-tailed)	.000	.000	0.327	.000		.000	.000
Interpersonal factors	Pearson Correlation	.436**	.426**	-.072*	-.278**	.548**	1	.681**
	Sig. (2-tailed)	.000	.000	0.02	.000	.000		.000
Environmental factors	Pearson Correlation	.532**	.468**	-0.055	-.339**	.589**	.681**	1
	Sig. (2-tailed)	.000	.000	0.074	.000	.000	.000	

Figure 1:

Strategies for coping with stress and anxiety



The resilience (RE) and family support (FS) are above the expected mean as well (RE, M=34.86, expected M=30.00; FS, M=12.21, expected M=9.00). The most resilient/supported subgroups are the following: non-diagnosed participants (RE, M=34.87; FS, M=12.23), vaccinated participants (RE, M=35.25; FS, M=12.42); males (RE, M=37.15) and females (FS, M=12.31); participants aged 56-75 (RE, M=38.08) and 36-45 (FS, M=12.37); participants with doctorate degree (RE, M=38.08; FS, M=12.75); participants that live in urban area (RE, M=34.96; FS, M=12.28); those that live alone/group of people (RE, M=36.84) and nuclear families (FS, M=12.43), the participants with salaries above 35.000 MKD (RE, M=35.93; FS, M=12.47); the self-employed/employed participants (RE, M=35.45; FS, M=12.43). The relations of the coping factors and perceived stress level and anxiety/depression symptoms were tested by using multivariate linear analyses (between-subject effects, see Table 3). Both resilience and family support have been confirmed as significant predictors of perceived stress level (Adjusted R^2 =36%; RE AR^2=36%; FS AR^2=6%) and anxiety/depression symptoms (AR^2=25%; RE AR^2=25%; FS AR^2=6%) which confirms that the resilience is the most important factor that predicts the stress and anxiety compared with all the other tested factors in our model. According to the results, family support is a weak predictor of the level of stress and anxiety.

According to the results from the descriptive statistics that represent the coping strategies of the participants (see Chart 1) it can be seen that the most used strategy for coping with stress and anxiety is talking with family and friends (60,69%), followed by watching TV, movie, series (59,92%), listening music (57,06%), researching/surfing internet pages (42,27%), cooking and trying new recipes (31,60). The coping strategies creative work, art, drawing (0.95%), talking with religious person (4,87%), meditation (10,40%), talking with professional/psychologist (11,55%) have been chosen as least used strategies for coping with stress and anxiety during COVID 19 pandemic.

DISCUSSION

This is the first research study on stressors, coping strategies, and psychological impacts of COVID-19 in North Macedonia. According to the findings, 86,9% of the participants experience moderate to high perceived stress, while 64,5% experience anxiety/depression symptoms on the moderate to the high level. The most vulnerable subgroups of participants are participants diagnosed with COVID 19 (diagnosed at the moment of the collecting data and in post COVID period), followed by the non vaccinated participants, with the dominance of the female population. Younger participants experience more stress and anxiety than older participants, and less educated participants have been confirmed as more vulnerable to stress and anxiety than more educated participants. People that live in rural areas are more exposed to stress factors than those that live in urban areas, especially if they live in extended families. Non-employed participants are more stressed and anxious than self-employed/employed participants and those that earn more money are less stressed and anxious compared to those that receive less salaries. In line with these findings, the most resilient subgroups are males, highly educated participants, participants from 56-70 years, those that are employed and earn more than 35.000 MKD, that live in urban areas, alone or in a group of people. Regarding family support, all groups presented high results especially highly educated individuals, females, and individuals aged from 36-45 years. The general level of resilience is medium to high, while the level of family support is considered high.

Regarding the COVID 19 related variables that predict the psychological impacts it is shown that the most important predictors of perceived stress level and anxiety/depression symptoms are CORONA 19 related stressors (individual factors: personal health, the health of family and friends, uncertainty, perception, and beliefs for COVID 19; interpersonal factors: online work/online school, internet/ virtual communication, perception and beliefs for COVID 19, quarantine/police hours and environmental factors: medical services, treatment, and availability, online work/online school, quarantine/ police hours, support from the governmental institutions, relevant information related to COVID 19, safety and security of the job places during COVID 19, social rights and services). The coping factors (resilience and family support) are significant predictors as well especially resilience that have the highest impact compared to all the other tested variables in our model.

The results are in line with the recent research studies (García-Fernández et al., 2020; Modersitzki et al., 2020; Vizheh et al., 2020; O'Connor et al., 2020) that confirms that the present Covid-19 pandemic stressors have inflicted emergency reactions worldwide to secure the physical safety of the population and dampen the scale of loss of lives due to the spread of the infection (Kuang et al., 2020). At the same time, the impact of the novel situation has changed the world as we used to know it almost overnight, not giving much time to prepare and adapt, aiming at the core and basic human needs for safety, freedom, and physical contact, leaving no one indifferent. It has been confirmed that individuals (especially younger adults, women, and those with the lowest household income, McGinty, et al., 2020) struggle to adapt to the situation and cope with the challenges they are facing. As mentioned in the theoretical framework of Lazarus (1966) it has been confirmed that resilience is the most important predictor for the psychological outcome which means that what is stressful for one person during COVID 19 may not be stressful for another person, or even for the same person at another time point.

To generate the study about psychological impacts, related stressors, and coping strategies of the COVID 19 pandemic, one year after the beginning of the pandemic, can encourage a lot of people to start thinking about their mental health condition and in the same time will inspire a lot of mental health professionals to use suitable strategies for prevention and treatment of their clients. Bearing in mind the unpredictability of the possible outcomes and the duration of this crisis, it puts individuals and nations in a prolonged state of stress and distress. This puts individuals and collectives at risk of acquiring mental health difficulties which can range from mild to severe reactions. Due to the fear of getting the infection many people in need of immediate or prolonged medical care or support are postponing their contact with medical personnel. The health system is enforcing emergency protocols and access only to patients with critical conditions, and contactless phone access to others in need of their services. This indeed helps the spread of the virus infection but puts a strain on the coping capacities of the individuals who struggle to adapt to the situation and cope with the challenges they are facing and feelings of uncertainty and unease, to stress, distress, or disorder. In this crisis, additional help is needed to address the rising mental health conditions by trained individuals for both immediate support via psychological first aid, but also via prolonged psycho-social support that will ensure support, reassurance, and hope and be a link to medical professionals, referring the ones in need of specific professional somatic and/or mental treatment (Lai et al., 2020).

This study has confirmed that the general mental state of the population is disrupted. The quality of life generally is changed and influences the individual, interpersonal and environmental adaptation to the novel situation. These findings have important implications for clinical work, public health, mental health professionals, etc. to mobilize their knowledge and skills and to act in an organized way towards the improvement of the mental health of the population. The mental health professionals should increase their awareness of additional needs and potential mental health problems experienced by the population in North Macedonia. The individuals may be motivated to ask for help and support, however, they may still feel uncomfortable and prefer to handle the mental health issues alone. Proactive measures are needed for reaching the needs of the clients via different online and face-to-face tools to strengthen the support and resilience that have been confirmed as a protective factor that enhances the potential of the individual for successful adaptation and coping.

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