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ORIGINAL ARTICLE /ORİJİNAL MAKALE

Assessment of adjustment disorder in people with COVID-19 infection

COVID-19 enfeksiyonu geçiren bireylerde uyum bozukluğu değerlendirilmesi

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Abstract

Objective: This study aimed to evaluate the development of adjustment disorder according to the ADNM-20 (Adjustment Disorder New Module-20) scale in participants who were followed up for Covid-19 infection.

Methods: A cross-sectional survey was conducted from September to November 2020. After sample size calculation, we aimed to reach minimum 170 people out of 1290 people who applied to the hospital for Covid-19 disease treatment. Participants were selected from the patients admitted to the hospital using a simple stratified random sampling method. We reached 182 people after treating the patients who were followed up with Covid-19 infection in a University Hospital in Istanbul, Turkey. A questionnaire and the Adjustment Disorder New Module-20 scale were applied via phone / mail at the end of the 6th month after Covid-19 related hospital admission by researchers.

Results: Adjustment disorder was found in 28.8 % (n=42) of the participants disorder according to the ADNM-20 scale. While the rate of development of adjustment disorder due to Covid-19-related stress was 26.7 % (n=39); the rate of development of adjustment disorder due to non-Covid-19 stress was found to be 2.1 % (n=3). With the increase in stress load, the development of adjustment disorder increased significantly. The frequency of developing Covid-19-related stress-related adjustment disorder was statistically significantly increased with the duration of exposure to stress.

Conclusion: We have found out that one out of every four people who apply to the hospital for healthcare services due to Covid-19 infection may develop an adjustment disorder. Assessment of the adjustment disorder more frequently and making early interventions may contribute to the prevention of progressive mental disorders.

Keywords: Covid-19, Adjustment Disorder, Mental Health

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Öz

Amaç: Bu araştırmada, uyum bozukluğu değerlendirme ölçeğine göre (ADNM-20); Covid-19 enfeksiyonu nedeniyle takip edilmiş hastalarda uyum bozukluğu gelişimini değerlendirmek amaçlandı.

Yöntem: Kesitsel tipteki araştırma Eylül- Kasım 2020 tarihleri arasında gerçekleştirildi. Hastaneye başvuran 1290 kişiden 170 kişiye ulaşılması hedeflendi. Bu süreçte hastaneye başvuran hastalardan tabakalı basit rasgele örnekleme yöntemi ile katılımcılar seçildi. Covid-19 enfeksiyonu nedeniyle İstanbul'da bir üniversite hastanesinde takip edilmiş tedavi edilen 182 kişiye ulaşıldı. Covid-19 ile nedeniyle takip edilen hastalara; hastaneye yatıştan sonraki 6. ayın sonunda telefon/posta yoluyla sosyodemografik sorular ve Uyum Bozukluğu Yeni Modül-20 ölçeğinden oluşan bir anket uygulandı.

Bulgular: Katılımcıların % 28.8'inde (n=42) uyum bozukluğu saptandı. Covid-19 ilişkili strese bağlı uyum bozukluğu gelişen katılımcılar %26.7 (n=39) iken; Covid-19 dışı stres nedenli uyum bozukluğu gelişme oranı %2.1 (n=3) bulundu. Stres yükü artışıyla uyum bozukluğu gelişimi istatistiksel olarak anlamlı şekilde artıyordu. Artan strese maruz kalma süresi ile Covid-19 ilişkili strese bağlı uyum bozukluğu gelişme sıklığı istatistiksel olarak anlamlı olarak artmaktaydı.

Sonuç: Covid-19 nedeniyle sağlık hizmeti almak için hastaneye başvuran her dört kişiden birinde uyum bozukluğu gelişebilmektedir. Uyum bozukluğunun daha fazla sorgulanarak erken müdahalelerde bulunulması ilerleyici ruhsal bozuklukların önlenmesine katkıda bulunabilir.

Anahtar Kelimeler: Covid-19, Uyum Bozukluğu, Ruh Sağlığı

INTRODUCTION

The new Coronavirus infection (Covid-19), which emerged in Wuhan, China in December 2019, spread all over the world in a short time, causing a global pandemic[1]. In this context, curfews have been implemented, schools and some workplaces have been closed or a flexible working system has been implemented, and strict isolation measures, such as travel restrictions, have been implemented. This situation has led to lifestyle changes (working from home, online education, sedentary life, etc.) in people's daily routines[2, 3]. Again, the high number of cases announced every day during this period and the constant effort of people to get new information through communication tools, such as social media, internet and television, brought about fear and anxiety[4-6].

Epidemics that are transmitted human-to-human are associated with anxiety, panic, depression, trauma-related disorders, and many more comorbidities[6]. For all these reasons, the mental health of the community may be adversely affected[7-9].

Adjustment disorder refers to a maladaptive emotional and/or behavioral response to an identifiable psychosocial stressor. The disorder occurs after an identifiable stressor; excessive anxiety is defined as

distressing, repetitive thinking about the stressor and its possible effects. Symptoms are characterized by responses to stress that cause marked distress and impairment in daily functioning above the socially and culturally expected levels[10]. Symptoms may appear within three months of the stressor, with emotional and behavioral manifestations[10].

According to International Classification of Diseases 11 (ICD-11), adjustment disorder symptoms that begin within the first month of exposure to stress are classified into two categories: stress-related excessive mental exertion and adaptation disorder in important activities (family, occupational, social) in the maintenance of life[11]. Also, adjustment disorder is known to be associated with an increased risk of suicide[12].

In studies conducted in pre-pandemic periods, the prevalence of adjustment disorder was reported as 2-29 %[13].

In this study, we aimed to evaluate the frequency of adjustment disorder according to the ADNM-20 scale in participants, following their visits to the hospital due to possible Covid-19 symptoms.

METHODS

The data of patients over the age of 18, who were followed up due to Covid-19 infection between 12.03.2020 and 31.05.2020 in a university hospital on the Anatolian side of Istanbul, was collected via telephone after six months, after obtaining the consent to participate in the study. The sample of the study consisted of 1290 patients in the Covid-19 research cohort, who were either outpatient or inpatient due to Covid-19 infection between the above dates.

The expected frequency in 1290 patients in the sample selection was 15%[13], with a margin of error of 5 %, and a design effect of 1.0. Therefore sample size was determined as 170 participants at the 95 percent confidence interval. Participants were stratified according to outpatients with positive PCR test results, Outpatients with negative PCR test results and inpatients and participants were included in the sampling using a simple random selection method was used in each strata. A total of 264 participants were submitted to the study but 82 participants rejected to participate the study. As a result, 182 participants were reached.

Participants with missing or wrong phone numbers, patients who did not speak Turkish, who were too disabled to answer the questionnaire, and those who died weren't included in the study.

As a descriptor in our study, the first part of the questionnaire was demographic data and clinical background (age, gender, occupation, marital status, educational status, history of psychiatric illness, drug use, history of receiving mental support during the Covid-19 period) were questioned.

In the second part of the questionnaire, the participants were asked ADNM-20 scale questions. The development of Adjustment Disorder was evaluated according to the answers given to the scale questions.

Adjustment Disorder New Module 20 (ADNM-20) Scale

The two-part scale, created by Einsle et al. in 2010, questions the stressors and symptoms that have affected the participant in the last two years. The first part consists of 18

questions; In this section, acute psychosocial stressors (divorce, death of a loved one, etc.) and permanent stressors (serious illness, conflict at work, etc.) are questioned. In this section, the current Covid-19 pandemic has been questioned as an additional stressor.

The second part consists of 20 questions; The severity of the individual's response to the stressful event(s) is questioned. On a 4-point Likert scale ranging from 1 (never) to 4 (frequently), it is determined how often and for how long the participants experience different symptoms of Adjustment Disorder. High scores are considered to be associated with Adjustment Disorder.

Two main symptoms, which are very important for the diagnosis of Adjustment Disorder, are questioned in ICD-11 in the ADNM scale; mental preoccupations (4 questions) and adaptation disorder (4 questions). In addition, avoidance (4 questions), depressive mood (3), anxiety (2), and impulse disorders (3), which are helpful symptoms in the diagnosis of adjustment disorder, are also asked[14, 15] in the ADNM-20 scale, available via UZH - Psychopathology and Clinical Intervention - Self-report Assessments website. In data analysis, the cut-off point value for the diagnosis of Adjustment Disorder was taken as 47.5 points[16]. The test sensitivity at this cut-off was 87% and the specificity was 74%[16]. The internal consistency of ADNM-20 sum score was high (Cronbach's α=0.94) [16].

The interviewers reached the participants by phone and completed the scale in the form of an electronic questionnaire. Some participants preferred to fill in the scales electronically after the interview. As a result, 182 participants were reached. Data collection was carried out between 15 September 2020 and 21 October 2020. It took between 20-45 minutes to complete the questionnaire.

In data analysis, the Chi-square test was used to compare numbers and percentages. Cronbach Alpha statistics were used to calculate internal consistency. For external validity, how the characteristics of the adjustment disorder group differed in comparisons between groups in terms of various variables were examined. To study external validity, patients who were under stress and who scored 4 points on at least one of the eight questions of the ADNM-20 scale about mental exertion and the inability to adapt were evaluated as definite adjustment disorder. The success of the scale in predicting these cases was analyzed by ROC analysis and a cut-off score was calculated for the study group. The statistical significance limit was accepted as $p < 0.05$. The cut-off point (47.5) [16] determined in the literature was used to determine adjustment disorder, and comparison analyzes were calculated for cases with adjustment disorder determined according to this cut-off point.

In our sample, Cronbach's alpha was found to be 0.94 for the scale's internal consistency. When the cut-off point is taken as 47.5[14] and when the validity is examined in terms of predicting adjustment disorder cases consisting of those who get full points from at least one of the mental preoccupation and/or inability to adapt questions; sensitivity was >95.2% and specifity was 100.0 %. Optimum sensitivity and specifity levels for the same output were obtained when the score limit was 47.0. At this cut-off point, the sensitivity was 100.0 % and the specifity was 100.0 %.

Adjustment disorder is an exclusion diagnosis[10]. Therefore, we excluded 27 participants with a previous diagnosis of psychiatric illness or a history of psychiatric drug use in the analysis of adjustment disorder.

Adjustment disorder could not be evaluated because 15 participants did not complete the questionnaire for various reasons. Since 27 people have psychiatric history, they are excluded, too.

RESULTS

Six months after the Covid-19 patients attend to the hospital 182 eligible participants were included in the study. 47.8% (n=87) of the participants were female, and the median age of the participants were 36.0 (min:19.0; max:85.0). Almost one fourth, 24.7% (n=45) of the participants were healthcare workers ; proportions of physicians, nurses, and other healthcare professionals 26.7 % (n=12), 35.6 % (n=16), and 37.8 % (n=17), respectively. The rate of participants with positive Covid-19 PCR test results was 36.8% (n=67). The proportion of participants whose Covid-19 PCR test was negative at the beginning and later became positive was found to be 5.5% (n=10) (Table 1). While 7.7% (n=14) of the participants were hospitalized patients due to Covid-19, 92.3% (n=168) of the participants were outpatients with positive or negative Covid-19 PCR test results. Approximately 14.8 % of the participants (n=27) had a previous diagnosis of psychiatric illness or a history of psychiatric drug use. Two of the participants had a psychiatric support because of covid-19.

Table 1. Demographic Characteristics of Participants

		n	%
Gender	Female	87	47.8
	Male	95	52.2
Covid-19 PCR Results	Positive	67	36.8
	Negative	115	63.2
Job groups	Health worker	45	24.7
	Others	137	75.3
Marital Status	Single	38	20.9
	Married	137	75.3
	Divorced/ Widow	7	3.8
Educational Status	Illiterate to secondary school graduate	72	39.6
	High school graduate	37	20.3
	Graduated from a University	73	40.1
Patient Follow-up	Inpatient	14	7.7
	Outpatient	168	92.3
Total Number of Participants		182	100.0

Almost two thirds, 65.4% of the participants (n=119) stated that they had experienced stress due to Covid-19 in the last six months. No adjustment disorder was found according to the ADNM-20 scale in 71.2 % (n=104) of the patients (Table 2).

While the rate of development of adjustment disorder due to Covid-19-related stress was 26.7 % (n=39); the rate of development of adjustment disorder due to non-Covid-19 stress was found to be 2.1 % (n=3) (Table 2).

Additionally, 9.8% (n=18) of the participants declared significant life stress over two years. The mean time to experience a significant stress event was 7.1 months. When the

Table 2. Evaluation of Adjustment Disorder Development in Participants Experiencing Covid-19-Related Stress by Stress Duration

		Adjustment Disorder							
		Adjustment Disorder No		Linked to Covid-19-Related stress *		Depends on Other Stress **		Total	
		n	%	n	%	n	%	n	%
Stressor Time	No stress	29	100.0	0	0.0	0	0.0	29	100.0
	Stress in six Months	53	63.1	30	35.7	1	1.2	84	100.0
	Stress For More Than six Months	22	66.7	9	27.3	2	6.1	33	100.0
	Total	104	71.2	39	26.7	3	2.1	146	100.0

* According to the stressor duration; when the development of Covid-19-related stress-related adjustment disorder was analyzed in the 3x2 Chi-Square table with individuals who did not experience stress, the Chi-Square p value was < 0.001.
** According to the stressor duration; Fisher's Exact probability test p value was found to be <0.001 when the development of other stress-related adjustment disorders was analyzed in the 3*2 Chi-Square table with individuals who did not experience stress.

development of adjustment disorder is evaluated according to the duration of exposure to Covid-19-related stress; no adjustment disorder was observed in the participants who did not declare Covid-19 stress, on the other hand, Covid-19-related adjustment disorder was observed according to the ADNM-20 scale in 35.7 % (n=30) of the participants who declared stress in the last six months. Covid-19-related stress-related adjustment disorder developed in 27.3 % (n=9) of the participants whose duration of exposure to the stressor exceeded six months (p<0.001) (Table 2).

One percent of (n=1) individuals who declared stress in the first six months developed adjustment disorder due to non-Covid-19 stressors, while 6.1 % (n=2) of individuals whose duration of exposure to stress exceeded six months developed adjustment disorder due to non-Covid-19 stressors. (p<0.001) (Table 2).

The development of Covid-19-related stress-related adjustment disorder was associated with the duration of Covid-19-related stress which was statistically significant (p<0.001) (Table 2).

While the rate of development of adjustment disorder was 27.8 % (n=37) in outpatients, the rate of development of adjustment disorder in inpatients was 38.5 % (n=5). This rate was not statistically significant (p>0.05). There was no statistically significant difference between socio-demographic variables (gender, education, marital status, occupation) (Table 3).

There was no difference between health care workers and other occupational groups in terms of developing adjustment disorder. Similarly, there was no statistically significant difference in the development of adjustment disorders among healthcare professionals (doctors, nurses, and others). (p=0.9; Fisher Exact test). There was no statistically

significant difference in terms of developing adjustment disorder according to the Covid-19 test result. There was no statistically significant difference in the development of adjustment disorder in patients whose Covid-19 test was initially negative but later became positive when compared with other participants (Table 3).

Table 3- Evaluation of Adjustment Disorder According to the Demographic Characteristics of the Participants

		Adjustment Disorder								
		No		Linked to Covid-19-Related Stress		Other Stress-Related Adjustment Disorder		Total		p Value
		n	%	n	%	n	%	n	%	
Gender	Female	41	67.2	18	29.5	2	3.3	61	100	0.70
	Male	63	73.3	21	24.4	2	2.3	86	100	
Covid-19 PCR Results	Positive	33	64.7	17	33.3	1	2.0	51	100	0.41
	Negative	71	74.0	22	22.9	3	3.1	96	100	
Job groups	Health worker	24	63.2	12	31.6	2	5.3	38	100	0.25
	Others	80	73.4	27	4.8	2	1.8	109	100	
Marital Status	Single	21	70.0	6	20.0	3	10.0	30	100	0.11
	Married	78	70.3	32	28.8	1	0.9	111	100	
	Divorced/ Widow	5	83.3	1	16.7	0	0	6	100	
Educational Status	Illiterate to secondary school graduate	34	61.8	19	34.5	2	3.6	55	100	0.32
	High school graduate	24	80.0	5	16.7	1	3.3	30	100	
	Graduated from a Universty	46	74.2	15	24.2	1	1.6	62	100	
Total Number of Participants								147	100	

* Fisher Exact Test

When the development of adjustment disorder due to non-Covid-19 stressors is evaluated; Adjustment disorder developed 50.0 % (n=9) of the participants who experienced the stress caused by the illness of a loved one developed adjustment disorder (p=0.03); In case of loss of a loved one, the rate of development of adjustment disorder was 61.9% (n=13) (p<0.001). In individuals experiencing stress due to workload, which is another stress factor; adjustment disorder developed in 50.0 % (n=13) of the participants with workload stress (p=0.008).

When comparing those with only Covid-19 stress (21.4%) and those who have any external stress with Covid-19 (35.7%) in terms of the risk of developing adjustment disorder; the risk of developing adjustment disorder was found to be statistically significantly higher for those who carry non-Covid-19 stress burden with Covid-19 (p<0.001) (Table 4). The incidence of adjustment disorder with increased stress load is statistically significant (p<0.001) (Table 4).

Table 4- Adjustment Disorder Development Status According to the Presence of Covid-19 and Non-Covid-19 Stressors

		Adjustment Disorder						p value
	Yes			No		Total		
		n	%	n	%	n	%	
Covid-19 and Non-Covid-19 Stress Load	No Stress	0	0	28	100	28	100	p<0.001 Linear-by-Linear Association; p<0.001
	One Non-Covid-19 Stress	2	25.0	6	75.0	8	100	
	Two non-Covid-19 Stress	1	9.1	10	90.9	11	100	
	Only Covid-19 Stress	6	21.4	22	78.6	28	100	
	Covid-19 Stress and Another Stress	10	35.7	18	64.3	28	100	
	Covid-19 Stress and More than Two Other Stress	23	53.5	20	46.5	43	100	
Total		42	28.8	104	71.2	146	100	

DISCUSSION

In our research, we studied the effect of Covid-19 stress on adjustment disorder. The first Covid-19 case in Turkey was diagnosed on March 11, 2020[17]. According to the best of our knowledge, this study is the first to investigate the relationship between the Covid-19 pandemic and the formation of adjustment disorder in our country. We also investigated the development of adjustment disorders in healthcare workers compared to other occupational groups. There was no difference between health care workers and other occupational groups in terms of developing adjustment disorder. Healthcare workers are among the risky occupational groups in terms of mental health, because of the higher virus load and intense working conditions in mass epidemics[18]. In our study, we have found out a relationship between Covid-19 related stress

and adjustment disorder. In addition, we have found out that the frequency of adjustment disorder increased with additional stressors. The likelihood of adjustment disorder showed positive association with the duration of exposure to stress.

It stated that 65.4% of the participants they had experienced stress due to Covid-19 in the last six months. In addition, since the population of our study consisted of individuals who attented to the hospital with the suspicion of Covid-19 in the first months of the pandemic; The first months of the pandemic in Turkey were evaluated, and the participants verbally stated that they felt uneasy due to the lack of information about the disease, the television-internet news exposure during this period, and the mandatory quarantine application. Brooks et al. also stated that stresses during quarantine include fear of infection, frustration, boredom, insufficient support, insufficient information, financial loss, stigmatization, and increased quarantine time[19].

In a web-based study conducted in Italy during the quarantine period, 37 % of people adjustment disorders were observed[6]. In the data in our research; adjustment disorder was found according to the ADNM-20 scale in 28.8 % of the participants. While 26.7 % of patients developed adjustment disorder due to Covid-19-related stress; The rate of development of adjustment disorder due to non-Covid-19 stress was found to be 2.1 %. In a study conducted in China in the early stages of the pandemic, 44 % of patients followed up due to Covid-19 were found to have adjustment disorder; In the same study, adjustment disorder was observed at a rate of 1% in patients followed for non-Covid-19 reasons[9]. In our study, the entire participant population consisted of individuals who visited to the hospital with the suspicion of Covid-19, and the incidence of adjustment disorder was 28.8 %.

All participants were included in a study conducted in Lithuania; they identified major life stressors for more than two years; The mean stressors of the participants were 2.44 (SD = 1.69) and ranged from 1 to 14[13]. In our study, the rate of participants who declared stress for more than two years was 9.8%. The mean time to experience a significant stress event was 7.1 months. The association between the increase in the duration of stress and the development of adjustment disorder were found to be statistically significant.

According to a study by Asmundson, people with anxiety or mood disorders were more negatively affected by the Covid-19 pandemic compared to people without a diagnosis of any mental illness[20]. In our study, Covid-19-related stress-related adjustment disorder was observed with a rate of 26.7% in the group diagnosed with mental illness in the past; this rate was statistically significantly higher compared to 15 %[13].

According to the Zurich Adjustment Disorder Study, the prevalence of adjustment disorder consistent with ICD-11 in individuals with job loss it was increased with exposure to multiple stressor factors[21]. Similar to this result, we also observed that the rate of development of adjustment disorder increased significantly, as the stress load increased. The stress caused by Covid-19 showed an exponential increase in adjustment disorder rate in those who have been exposed to other stress factors.

These results also support the external validity of the ADNM-20 scale in terms of the rate of adjustment disorder, the relationship between adjustment disorder and stress, and the increase in adjustment disorder with increasing stress load. In our study, when the internal consistency was analyzed by excluding the participants with a psychiatric history, results compatible with the literature were obtained. Our study population consisted of a stressed and mentally challenged group, our sample was not representative of the healthy population. The frequencies we found are already high, and it can be thought that this frequency may be higher. Further studies are needed for determination of cutoff points in our healthy population.

Limitations

Conducting the survey via telephone/mail was one of our biggest limitations. During the survey, it was observed that the young age group was less attentive to the research compared to the middle age group. Of our participants, 15 did not complete the ADNM-20 Scale. Non-response may have been observed due to Covid-19 adjustment disorder and Covid-19 stress. Since adjustment disorder was an exclusion diagnosis, participants who had a previous psychiatric illness or declared that they had used psychiatric drugs before were also excluded from the analysis. However, individuals who are found to have adjustment disorder according to the ADNM-20 scale may also include depressed or anxious individuals.

Since the questionnaire evaluates an illness experienced 5-6 months ago and a period after, recall bias may exist. Due to limited number of observation, comparisons among sociodemographic characteristics might show nonsignificant results. Our research may not reflect the society, as our research population consists of a group that is under stress and being ill. However, it represents those who applied to the hospital.

Since our study population consisted of individuals who applied to the health institution with the suspicion of Covid-19 in the first months of the pandemic, Covid-19 concerns in this population may have created a bias. Despite having limitations, according to our literature review, there are limited number of studies on adjustment disorder related to the Covid-19 pandemic, and no research on this subject has been found in Turkey. Thus, our research may be remarkable in this respect. In future studies, large sample groups can be recruited to achieve more accurate results and clear conclusions.

CONCLUSION

Covid-19 infection is widely observed as a stressor. The most common response to stress in this kind of pandemic is adjustment disorder. One out of every four people who apply to the hospital for health care due to Covid-19 may develop adjustment disorder. The combination of Covid 19 stress and other stress factors increases the frequency of adjustment disorder. The prolongation of the stress of Covid-19 increases the cases of adjustment disorder. Early intervention by further questioning the presence of Covid-19 stress and adjustment disorder may contribute to the prevention of progressive mental disorders.

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Authorship Contributions: Concept: ŞP, AT, Design: ŞP, AT, Supervising: ŞP, AT, , Financing and equipment: ŞP, AT, Data collection and entry: ŞP, AT, Analysis and interpretation: ŞP, AT, Literature search: ŞP, AT, , Writing: ŞP, AT, Critical review: ŞP, AT.

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