Research Paper: Comparison of Meta-Worrying, Mental Rumination, and Cognitive Distortions in Recovered Patients of COVID-19 and Normal People

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Abstract

COVID-19 has shown a high rate of spread and a high death rate. This disease puts the mental health of people in a different social class at risk. The present study was a comparison of meta-worry, rumination and cognitive distortions in COVID-19 pations recovered and normal individuals. Causal-comparative model was hired in the present study. The population of this study included all COVID19 patients recovered as well as normal people referring to Tonekabon health centers in the period of July and August 2021, of which 120 people were selected according to convenience sampling. The research instruments were meta-worry Questionnaire (MWQ), the ruminative response scale (RRS) and cognitive distortions scale (CDS). To analyze the collected data, a MANOVA was run using SPSS-24 software. Data analysis reveal that there were differences between meta-worry, mental rumination and cognitive distortions in the two groups of people who recovered from COVID-19 and normal people; those who recovered from COVID-19 indicated more meta-worry, mental rumination and cognitive distortions than normal people. It can be said that based on the results of this research indicating the higher level of rumination, cognitive distortion and meta-worry in people recovered from COVID-19, it is possible to reduce these variables by teaching adaptive strategies to recovered people to deal with meta- worry, rumination and cognitive distortion.

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1. Introduction

Coronaviruses are a large family of viruses that can cause respiratory infections ranging from the common cold to more severe diseases such as MERS and SARS. The new type of this virus has recently spread in Wuhan, China, under the name COVID-19 (World Health Organization, 2020). Regions with confirmed COVID-19 cases by the World Health Organization (WHO) include Africa, the Americas, the Eastern Mediterranean, Europe, Southeast Asia, and the Western Pacific (Robbins & Klotz, 2020). In Iran, COVID-19 also spread rapidly and endangered people's both physical and mental health. Symptoms of this virus range from mild to severe ones. Symptoms and signs of infection include fever, cough, and difficulty breathing (Wu &McGoogan, 2020). In the latest statistics from the Worlometers database in 2022, 643,215, 399 people in 288 countries of the world were infected with COVID-19, out of which, 6,626,455 people died (Worlometers, 2020). According to the official statistics of the Ministry of Health, Treatment and Medical Education until July 15, 2020, the number of cases of COVID-19 in Iran reached 264,561 people. This amount of broad spread of COVID-19 and the number of deaths caused by this virus caused the World Health Organization to declare a health emergency and take measures to control the virus and manage it. To contain this virus, the officials and decision-makers of the health and treatment field have to implement measures such as quarantine and isolation of people, closure of recreational centers, businesses, schools, and universities, providing health protocols, setting up hospitals, practicing physical and social distancing, imposing restrictions on traffic, informing people through the media,

enforcing the use of masks and disinfectants on a large scale (Lai et al., 2020).

Anxiety is a common symptom in patients with the chronic respiratory disorder and can significantly reduce the patients' quality of life. In almost the majority of cases, the measurement of anxiety includes physical cases, which can overlap with the symptoms of chronic respiratory disease and side effects of drugs (Dong et al., 2017). Clinical anxiety affects up to two-thirds of chronic respiratory patients and reduces the quality of life and physical performance. People become anxious as they hear about the increasing number of people infected with COVID-19, which threatens their security and peace (Shim et al., 2020). Such people constantly worry about their health and constantly check their physical health and vital signs (Stuart et al., 2019); these worries may become meta-worry. Meta-worry is the transformation of normal worry into abnormal worry through negative beliefs and evaluations, which plays an important role in damaging health (Spada et al., 2016).

In other words, a negative evaluation of worry or worry about worry is called meta-worry, which involves catastrophizing worry and is difficult to be controlled mentally (Myhr et al., 2019). This structure causes the intensification and stability of worry and the formation of pathological worry. Although meta-worrying causes an increase in stress, anxiety, and worry, s/he does not try to break the chain of worry, since the person thinks the need to worry is a kind of coping strategy (Esbjorn et al., 2015).

Another psychological problem that can negatively affect the mental health of patients is mental rumination. It seems that mental rumination about the disease and its symptoms and consequences can lead to the creation and persistence of COVID-19 anxiety (Azizi Aram & Basharpour, 2020). According to Martin and Teiser (1996), the concept of rumination refers to a thinking style that tends to repeat itself (Robinson & Alloy, 2003). From their point of view, rumination introduces a set of conscious thoughts that revolve around an important issue and these thoughts emerge even in the absence of immediate and necessary environmental demands. The external environment may lead to maintaining these thoughts by providing signs, but at the same time, maintaining these thoughts and continuing them is not dependent on environmental signs. Moreover, rumination is defined as resistant and recurring thoughts that go around a common topic, enter consciousness through involuntarily and divert attention from the desired topics and current goals (Joormann, 2010). According to the studies, patients of COVID-19 have low psychological tolerance and according to the current situation of the disease in the world, these people are highly exposed to the occurrence of psychological disorders such as anxiety, fear, depression, as well as negative thoughts and cognitive distortions (Yao et al., 2020). A person's important schemas or beliefs are subject to cognitive distortions. Since most schemas begin in childhood, the thought processes that support this schema may reflect childhood mistakes. Cognitive distortions appear when information processing is incorrect or ineffective. In other words, sometimes the analysis of information is distorted in people's minds. These types of distortions, which are called

cognitive errors and distortions, appear in various forms. If these distortions occur intermittently and frequently, they can lead to discomfort or psychological disorders such as obsessive-compulsive disorder (Goldin et al., 2009).

Currently, there is no information about the psychological impact and general health of people at the height of the COVID-19 epidemic. This is particularly related to the uncertainty surrounding the spread of this virus, and most of the research related to this spread is focused on identifying the epidemiology and clinical characteristics of infected patients (Huang, 2020). Considering that these kinds of diseases put a lot of pressure on people both physically and psychologically as well as culturally and socially (Shrewsbury, 2005; Shivandi & Hasanvand, 2020). Living in such conditions seriously threatens people's physical and mental health, for the effects of injuries and psychological pressure caused by the crisis of the COVID-19 virus remain on people and may affect the dimensions of mental health, and these psychological dimensions are unknown. There is little scientific and research information about it. On the other hand, the research conducted during this period are more of the survey type estimating the anxiety and depression level of COVID 19 patients, medical staff, and other people, mainly from the Chinese community; they have not explained, recognized and thoroughly understood the experiences of ordinary people in this disease (Greyling et al., 2020).

Research results indicate that people using negative and weak cognitive styles such as rumination, catastrophizing, and self-blame during the COVID-19 pandemic are more vulnerable to emotional problems

than other people. In fact, people who are unable to properly manage their emotions in the face of the stress caused by COVID-19 experience more stress, depression, and anxiety (Bagheri Sheykhangafshe, 2022). In addition, according to the research conducted by Eyni et al. (2021), students' mental health has a significant negative relationship with the anxiety of COVID-19 and cognitive distortion, and a significant positive relationship with psychological toughness.

Therefore, considering the importance of psychological problems of affected people on one hand and the lack of research done in this field on the other hand, it is necessary to pay attention to psychological problems such as anxiety, stress, mental rumination, and cognitive distortions of affected people. To reduce these problems, necessary measures should be taken; it seems to be necessary to conduct research on this issue and in this field. Based on the mentioned ideas, the current research seeks to answer the following question: Is there a difference between meta-worry, mental rumination, and cognitive distortions in those who have recovered from COVID-19 and normal people?

2. Method
The method of this research was cross-sectional causal-comparative.

2.1. Participants
The population of the present study included all the recovered people of COVID-19 and normal people from the city of Tonekabon in the period of July and August 2021. The population consisted of 120 people who were assigned into two groups, 60 people recovered from COVID-19 and 60 normal people who were not

infected with COVID-19. First, the group of people who have recovered from COVID-19 were selected through convenience sampling after coordinating with the Islamic Azad University of Tonekabon and obtaining permission from the health centers. The group of normal people were also selected through convenience sampling; they completed the research questionnaires administered. Moreover, the groups were selected in terms of age and gender through homogeneous sampling method. The criteria for entering the research included the recovery from the disease of COVID-19 (group 1), normal people (group 2), age range 20-50, education of at least middle school degree, giving consent to participate in the research; not having specific physical and mental problems and completing the questionnaire; these were among the criteria for inclusion in the research. The research data collection tools were as follows:

2.2. Tools
Meta-Worry Questionnaire (MWQ): After separating the items related to meta-worry from the questionnaire, Wells (2005) placed their worry thoughts in an independent questionnaire called the meta-worry questionnaire. This questionnaire contains 7 items. The scoring of this questionnaire is based on a multi-choice question so that one point is for never, two points for sometimes, three points for often, and four points for always. The minimum score of this questionnaire is 7 and the maximum score is 28. The cut-off point for this questionnaire has not been determined. Cronbach's alpha coefficient of the meta-worry frequency scale was 0.88. In terms of construct validity, this questionnaire can

distinguish people with generalized anxiety disorder criteria from people with somatic symptom disorder and people without anxiety. In the present research, Cronbach's alpha coefficient of the meta-worry was estimated at 0.78.

The Ruminative Response Scale (RRS): Nolen-Hoeksema and Morrow (1991) developed a self-test questionnaire that evaluated four different types of reactions to negative mood. The Response Styles Questionnaire (RSQ) consists of two sub-scales as Rumination response scale (RRS) and distracting responses scales (DRS). This tool has 22 items, and the respondents are asked to rate each one on a scale of never (1), sometimes (2), often (3), and always (4) (Treynor et al., 2003). A score of 22 to 33 indicates low rumination, a score of 33 to 55 specifies moderate rumination, and a score above 55 designates high rumination. Cronbach's alpha coefficient was in the range of 0.88 to 0.92. Various research revealed that the test-retest correlation for the RRS was 0.76 (Luminet, 2004). The predictive validity of RRS was tested in a large number of research. The results of many research showed that RRS can predict the severity of depression in follow-up periods in clinical and non-clinical samples by controlling variables such as the initial level of depression or stressful factors. Additionally, based on research findings, this scale can determine people's vulnerability to depression. In addition, it has been shown that this scale can predict a clinical course of depression (Bagherinejad et al., 2010). In this research, Cronbach's alpha coefficient was estimated at 0.88.

Cognitive Distortions Scale (CDS): The present questionnaire was created by Abdollahzade and Salar (2009) to obtain an easy tool for identifying the cognitive distortions used in daily life. This questionnaire is based on Ellis's cognitive distortions measuring 10 known distortions identified by Albert Ellis. This questionnaire, containing 20 questions, is scored based on the 5 options Likert scale. Each of the questions is assigned a score from 1 to 5 depending on the answer given; option I, completely agree, is scored 1, I agree is scored 2, I have no opinion, score 3, I disagree, score 4, I completely disagree, score 5, and only question number one is scored in reverse from 5 to 1. A score of 1 to 20 indicates poor thinking, 21 to 60 shows average thinking, and a score above 60 indicates very good thinking. (Jafarian & Askari, 2019). In Abdollahzade and Salar's (2009) research, conducted on the Iranian population (151 women and 146 men) to standardize this questionnaire, Cronbach's alpha was 0.80. In this research, the alpha coefficient was estimated at 0.70.

2.3.   Data analysis procedure
To analyze the collected data, Levin's test, Mbox test, and multivariate analysis of variance (MANOVA) were used running SPSS-24 software, and the level of significance in the current study was at 0.05.

3. Results
Table 1 shows the results of the demographic survey based on gender and age of the two groups: recovered from COVID-19 and normal people.

Table 1.

Frequency distribution of people in the sample group according to gender and age

variable		Recovered from COVID-19	Normal People
Gender	Female	(62%)37	(57%)34
	Male	(38%)23	(43%)26
Age	The lowest number of age ranges (20-30)	(24%)9	(43%)14
	The largest number of age ranges (31-40)	(38%)26	(38%)26

In Table 2, the descriptive statistics of the research variables are given for two groups recovered from COVID-19 and normal people.

Table 2

Statistical characteristics of the dependent variable components in the two groups of recovered from COVID-19 and normal people

Components	Recovered from COVID-19		Normal People	
	MD	SD	MD	SD
Meta-Worry	16.63	4.254	12.21	3.800
Mental Rumination	48.00	10.801	39.41	8.762
Cognitive Distortions	70.30	8.853	63.35	7.482

According to Table 2, it is clear that there was a significant difference between the average of those who recovered from COVID-19 and the average of normal people in the dependent variables.

The results of Levine's test indicated its non-significance for the variables of cognitive distortions (F=3.642, P=0.059), mental rumination (F=3.748, P=0.055), and Meta-Worry (F=1.106, P=0.295). In other words, the assumption of the equality of variances was violated in any of the components. Therefore, MANOVA can be used to identify significant difference between the variables in these two groups.

Table 3
Statistical data concerning MANOVA to identify significant difference between the two groups

Source		Sum of Squares	Degrees of Freedom	Mean of Squares	F	The significance level	Eta
between-groups	Cognitive Distortions	1449.075	1	1449.075	21.567	.000	.155
	Mental rumination	2210.208	1	2210.208	22.848	.000	.162
	Meta-worry	585.208	1	585.208	35.964	.000	.234
within-groups	Cognitive Distortions	7928.250	118	67.189			
	Mental rumination	11414.583	118	96.734			
	Meta-worry	1920.117	118	16.272			
Total	Cognitive Distortions	545247.000	120				
	Mental rumination	242875.000	120				
	Meta-worry	27475.000	120				

Eta-squared showed that approximately 23% of the variance of the meta-worry variable, 16% of the variance of the mental rumination variable, and 15% of the variance of the cognitive distortions variable were accounted for the group variable.

4. Discussion

The purpose of the present study was to compare meta-worry, mental rumination, and cognitive distortions in two groups of recovered people from COVID-19 and normal people. Based on the findings, there was a difference between meta-worry, mental rumination, and cognitive distortions in two groups of recovered from COVID-19 and normal people. The present study's results are in agreement with the research findings of AmirFakhrai et al. (2020) which showed that the variables of health concern, psychological toughness,

and positive meta-excitement predict changes in anxiety of COVID-19 in diabetic patients. Moreover, this substantiates the previous findings in the literature (Eyni et al., 2021); they found that the mental health of students had a significant negative relationship with the anxiety of COVID-19 and cognitive distortion, and a significant positive relationship with psychological toughness. In research on healthcare workers, Lai et al. (2020) reported that most of the participants in the research revealed symptoms of depression, anxiety, insomnia, and confusion and a large number of people experience significant clinical fear and anxiety during the outbreak of an infectious disease. Today, worry and rumination are among the persistent and recurring negative thoughts that cause and continue psychological damage by increasing confusion, increasing negative emotions

and creating negative states to avoid other perceived threats, and disrupting cognitive functions such as problem-solving and interpersonal functioning (Erickson et al., 2020). Research results stated that cognitive distortions were the strongest predictors of depression, obsessive-compulsive disorder, and anxiety disorders. People suffering from these disorders have distortions in their thoughts such as extreme generalization, hasty conclusions, and personalization of things; in these negative thoughts, traces of stable and uncontrollable internal documents can be seen. These distortions cause more defects in a person's adaptation to situations. The results of research showed that there was a relationship between cognitive distortions and irrational beliefs with anxiety and depression disorders (Eidelman et al., 2016).

Considering that the results of the present research indicated that those who recovered from COVID-19 demonstrated more meta-worry than normal people; therefore, it can be said that worry is a natural cognitive phenomenon that all people experience in certain situations of life. A lot of evidence highlighted that normal people also get worried, although the intensity, frequency, and ability to control this phenomenon in normal people are different from people with disorders. Descriptively, worry is dominated by negative thought activity, which is mostly about negative events that a person fears will happen in the future. Worry is a coping response caused by uninvited thoughts and is mainly focused on a range of issues such as physical health, and social or financial concerns. Thought control strategies increase the number of unwanted thoughts and strengthen the belief that worry is

uncontrollable, causing failure to control worry. Researches have shown that worry is associated with an increased risk of social disorders, mental as well as occupational disorders, more use of health services, and physical problems in society. Some researches highlighted that worry reduces the body's resistance to infection. In general, many physical and psychological aspects of the human being are affected by worry and this can lead to physical complications (Zemestani et al., 2016). Considering all the evidence, due to the experience of physical hardships and conflicts with health issues, it can be finally stated that in the group of people recovered from COVID-19, the number of unwanted thoughts and the belief related to the uncontrollability of the anxiety related to COVID-19 strengthened; this itself seriously disrupted all aspects of these people's lives.

In addition, the results indicated that there was a significant difference between the two groups in the variable of mental rumination; This means that those recovered from COVID-19 showed more mental rumination than normal people. According to the findings, it can be said that although a lot of attention has been paid to the measures related to the identification of people infected with the COVID-19 virus, the identification of the mental health needs of people affected by this widespread disease has been neglected. It seems that rumination about the disease and its symptoms and results can lead to the creation and persistence of COVID-19 anxiety. Rumination is defined as persistent and recurring thoughts that revolve around a common topic. These thoughts enter consciousness involuntarily and divert the attention away from the current issues and

goals. Rumination is a way to respond to confusion, which is especially accompanied by the onset, intensity, and maintenance of depression. Researchers believe that people ruminate because they believe that rumination increases their understanding of the situation and helps them to think about problem-solving. The researchers highlighted that in people who have anxiety disorders, a high level of mental rumination is observed. Furthermore, in another research, it was reported that people with anxiety disorders and depression experience more rumination and worry (Azizi Aram & Basharpour, 2020). In rumination, thoughts are repeated without environmental demand and focus on the causes and results of the symptoms, hindering problem-solving and leading to the rise of negative and repetitive thoughts. Rumination is annoying. It interferes with a person's activities and in particular; the people tend to focus repeatedly on stressful symptoms causing stress (Junwen et al., 2013). Finally, it should be added that rumination becomes incompatible with the intensification of negative feelings and the risk of engaging in confrontational behaviors and exposes a person to many anxiety-provoking confrontations, and as a result, causes a type of chronic worry, with a negative impact on a person's well-being.

Besides, the results indicated that there was a significant difference between the two groups in the variable of cognitive distortions. This means that those who recovered from COVID-19 showed more cognitive distortions than normal people. According to the obtained results, it can be said that in the period of COVID-19, people faced physical and psychological problems such as stress, confusion, anger, despair, and other mental injuries in addition to

enduring the difficulties caused by home quarantine; the spread of this disease turned into a social crisis that not only involved the body and personal health of people, but also as a social crisis in a complete and broad sense, and even as a super crisis. On the other hand, due to the existence of some human inabilities, in some cases, the effects of crises are overestimated or underestimated, which is called cognitive distortion using a specific cognitive model. Cognitive distortions such as external events that cause discomfort, depression, and interpersonal problems play an important role in the occurrence of many mental disorders. These cognitive distortions lead to the formation of assumptions about oneself and the surrounding world, used in the organization of perception and control and evaluation of behavior. Some assumptions are flexible and make predictions about the future, and in turn, cause behavioral, motivational, cognitive, and physical symptoms resulting in depression, anxiety, and psychological pressure. Cognitive distortions are ways that simply convince our minds of things that are not true, and as false thoughts, they usually reinforce negative thinking that leads to a bad and unpleasant feeling about ourselves (Shivandi Chaliche & Mostafaei, 2021). In the conditions of the spread and epidemic of COVID-19, cognitive distortions in people could lead to the processing of incorrect or ineffective information in the minds of people making the realistic analysis of interpersonal relationships difficult, which leads to psychological damage such as restlessness, anxiety, and disturbed relationships in a person's life.

The current research also had limitations. Considering the fact that the

present research had convenience sampling method, the generalization of the results should be done with caution. It is suggested that the influencing variables on people's psyche be identified in future research with a local perspective and the recognition of personality, cultural and family characteristics.

5. Conclusion

Considering the results of this research, indicating a higher level of rumination, cognitive distortion, and meta-worry in those who have recovered from COVID-19, it is possible to reduce these variables by teaching adaptive strategies to recovered people to deal with meta-worry, rumination, and cognitive distortion. It is also suggested that in the conditions of infectious diseases, such as the COVID-19 virus, which has a high transmission rate, the hiring of mental health experts to teach problem-solving, cognitive reconstruction, and providing those recovered with other psychological treatment techniques, who felt powerless against this disease, can be useful.

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Conflict of Interest

The Authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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