

Investigating the Levels of Obsession, Fear, and Self-Care Behaviors Related to COVID-19 in Fully Vaccinated and Partially Vaccinated Diabetic Patients

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Abstract

Introduction: Fears and obsessions related to COVID-19 can play important roles in self-care behaviors, including vaccination, among diabetic patients. Considering the importance of this topic, this study investigated the levels of obsession, fear, and self-care behaviors related to COVID-19 among fully vaccinated and partially vaccinated diabetic patients.

Methods: This was a causal-comparative research study involving 362 diabetic patients who were fully vaccinated and partially vaccinated as the population. An available sampling method was used to select these patients referring to Torbat Heydariyeh vaccination centers. The Fear of COVID-19 Questionnaire, the COVID-19 Obsession Scale, and the Self-Care Questionnaire related to Corona were used as instruments in the present study. The data were analyzed using chi-square and two-sample t-tests and SPSS 21 software.

Findings: There was a significant difference between the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in two groups of fully vaccinated and partially vaccinated ($p < 0.05$). Moreover, according to the observed means, it can be argued that the mean values of the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in diabetic patients who were fully vaccinated were higher than in the group of people with partial vaccination.

Conclusion: In order to increase self-care behaviors and reduce fears and obsessions of people with chronic diseases, including diabetes, psychological programs and psychologists can be used in the design of care and treatment programs, including vaccination against contagious diseases such as the coronavirus.

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Keywords: Obsession caused by COVID-19, Fear of COVID-19, Self-care behaviors, Diabetic patients, Full vaccination, Partial vaccination.

1. Introduction

COVID-19 is a contagious disease caused by the acute respiratory syndrome coronavirus^{[1][2]}. The first known case was detected in Wuhan, China, in December 2019^{[3][4]}. The coronavirus has accounted for more than 205 million cases so far (November 21, 2020), of which Iran's share was slightly less than 4.5 million people^[3]. COVID-19 is mainly a respiratory disease, but it can affect the brain and other organs such as the kidneys, heart, and liver^[2]. Neuropsychiatric manifestations are common during viral epidemics, but they are not effectively addressed. Preventive protection measures along with effective vaccines are the best strategies to fight this deadly disease^[5]. Currently, there are four types of viral vaccines, including inactivated/weakened vaccines, protein-based vaccines, viral-vector vaccines, and RNA/DNA vaccines^[6]. Successful immunization against COVID-19 is the biggest challenge for the majority of current governments. Recent studies around the world have reported citizens' mistrust of health systems^{[7][8][9]}. Therefore, increasing vaccination and its acceptance rate among citizens should be put on the agenda by governments, and the necessity of vaccination should be proved to the people.

However, unfortunately, the authorities, some governments, health professionals, and some people's false information have been propagated through social media^[10]. The World Health Organization (WHO) has listed vaccine skepticism among the ten major threats to health worldwide^[2], and the discussion of vaccine evasion and efforts to make vaccination seem dangerous have become one of the main problems of advanced societies. A study in Heidelberg (2020), Germany, proved that vaccination with 50% effectiveness is almost as effective as vaccination with 100% effectiveness, while all the vaccines available in Iran provide at least 60% immunity^{[11][12]}. But still, many people refuse to get vaccinated. They don't believe in it, and we need more research to prove the usefulness of vaccines, considering the special characteristics of this virus, i.e., unpredictability, high mortality rate, high rate of spread, multiple mutations, and not knowing a specific time for its end. Finally, this disease may bring about various psychological consequences such as fear, anxiety, and obsession among different strata of society^[13]. As a result, examining these variables in different strata of society to prevent psychological crises is also one of the important issues that must be addressed.

Fear is a natural, powerful, and primary human emotion^[14]. It includes global biochemical as well as heightened emotional responses. Fears inform us of the existence of danger or the threat of harm, whether this danger is physical or psychological. Sometimes fear originates from real threats, but it can also originate from imaginary dangers^[15]. Fear can also be a symptom of some mental health conditions such as panic disorder, social anxiety disorder, and post-traumatic

stress disorder (PTSD) [16]. Based on the studies conducted so far, patients with diabetes are more afraid of COVID-19, and various behavioral changes have been reported in them [17].

Obsession and disturbing thoughts are mental pressures to continue a thought or an action that the person knows is irrational but is unable to stop [18]. In the current situation, and according to the health recommendations for avoiding physical contact with others, constantly washing hands, staying at home, and refraining from attending gatherings, anxiety and obsessive thoughts may appear more frequently. In this case, people with obsessive-compulsive disorder may experience more obsessive thoughts, and people who do not have obsessive-compulsive disorder may also temporarily experience pseudo-obsessive thoughts and behaviors [7][8]. Diabetic people are not excluded from this group due to their private habits and behaviors during the days and nights, and they also need a series of special care [19].

Diabetes is a chronic underlying disease that occurs when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin produced [20][21]. Diabetes is a disease that damages many vital organs of the body and paves the way for other diseases like blindness, kidney failure, heart attacks, strokes, and lower limb amputations [22]. Four hundred sixty million people in the world are suffering from diabetes [23], and in Iran, 11% of people over 21 years of age, equivalent to 5.5 million people, are suffering from it. In 2019, about 4.2 million people died of diabetes. That is, approximately 11.3% of all deaths in the world were due to diabetes and its complications. Global statistics indicate that the prevalence of diabetes and deaths caused by it are increasing in different countries and ages, so that now one person dies every eight seconds due to this disease. In addition, the number of people with diabetes will double by 2040 [14], but COVID-19 has created special conditions all over the world, and diabetic patients are one of the main groups at risk and need to be addressed [24]. A healthy diet, regular physical activity, maintaining a normal body weight, and avoiding smoking are ways to prevent or control diabetes [17].

Self-care behaviors include learnable, conscious, and purposeful actions that each person takes for themselves, their family, and others to stay healthy, protect their physical and mental health, and meet their social needs [25]. However, the variables mentioned (fear) and intellectual and practical obsessions in the era of COVID-19 can have negative impacts on people's behaviors and activities. Various studies have been conducted worldwide regarding the psychological problems of COVID-19 [26][14][16][19], and a limited number of studies have also investigated the problems of vaccination [10]. Since the start of vaccination, the number of corona patients and behavioral diseases resulting from COVID-19 has decreased significantly [27], while the importance of this issue for certain groups, including diabetic patients, has not been taken into account. Studies in Iran have also been very superficial and transient in this field, and most of them have examined the role of health literacy in health promotion in specific states [28]. For this reason, in this study, the researchers decided to compare fully vaccinated and partially vaccinated diabetic patients in terms of fears, obsessions, and self-care behaviors related to COVID-19. The results can help practitioners get to know diabetic people, their behavioral differences after vaccination, and evaluate their self-care behaviors during COVID-19, which will help to improve the mental health of diabetic people and encourage them to get vaccinated.

2. Methods

It was a causal-comparative study conducted with the aim of determining the levels of obsession, fear, and self-care behaviors related to COVID-19. The research population consisted of fully vaccinated and partially vaccinated diabetic patients referring to Torbat-e Heydarieh vaccination centers in 2022. They were selected using the available sampling method. Based on a similar study ^[17] and based on the two-sample t-statistics at a 95% confidence level, a number of 362 individuals (181 people in the case group and 181 people in the control group) were selected. Thus, after completing 400 questionnaires, 38 incompletely completed questionnaires were removed from the study, and 362 questionnaires were analyzed. After obtaining the code of ethics and receiving a letter of introduction to conduct research from Torbat-e Heydarieh University of Medical Sciences, 5 centers were randomly selected among the 9 vaccination centers in the city. Then, the objectives of the research were explained to them, and with the help of healthcare providers and referring to the relevant databases, diabetics with incomplete vaccination and complete vaccination were identified. Necessary data including demographic information, vaccination date, and contact number of the patients were also extracted from their files. Then, the electronic questionnaires were provided to the sample through social media messages, and the completed questionnaires were received on the same day or the following days. The criteria for entering the study included: patients with diabetes diagnosed by a physician, the patient's knowledge and consent to participate in the study, having access to WhatsApp, patients with diabetes who have received the COVID-19 vaccine (injection of four doses of the vaccine for the full vaccination group), and people with diabetes who have not injected the COVID-19 vaccine (injecting less than four doses of the vaccine for the partial vaccination group). Exclusion criteria were: drug addiction and smoking (based on the patient's history), any physical and mental disability, having a psychiatric illness, and incomplete completion of the questionnaire.

2.1. Questionnaire of fear of COVID-19

It was first developed by Ahorsu et al. and is a 7-item self-report instrument that assesses the level of fear caused by COVID-19 on a 5-point Likert scale, ranging from completely disagree (1) to completely agree (5). The Cronbach's alpha value was 0.82, the composite reliability value was 0.88, the test-retest coefficient was 0.72, and the fit of the research questions was confirmed using question performance difference analysis. The correlation of the instrument with the depression scale was 0.42, and with the general anxiety level, it was 0.51. The reported construct validity indices also showed a good fit. The minimum and maximum scores a person can achieve on this scale range from 7 to 35, with a higher score indicating greater fear. The Cronbach's alpha of the instrument in the present study was 0.87, and the reliability coefficient was 0.83 ^[29].

2.2. Questionnaire of Obsession Caused by COVID-19

The initial version of this scale was prepared by Lee. This scale seeks to answer whether thinking about the coronavirus disease becomes a disorder. This scale has a correlation with anxiety about the coronavirus, spiritual crisis, dealing with drugs and alcohol, extreme hopelessness, and suicidal thoughts. The diagnostic features of the tool (sensitivity 81% to 93%, specificity 73% to 76%) are also comparable to other related screening tools such as the GHQ ^[30]. In Iran, its reliability and validity were investigated, and the Cronbach's alpha of the instrument was 0.79, and the reliability coefficient

was 0.77 [31]. This questionnaire has 4 items, and each item has a scale of 5 from not at all (0), rarely (1), less than one or 2 days (2), the last few days (3), more than 7 days (3), and almost every day during the last 2 weeks (4). Scores higher than or equal to 7 indicate the possibility of obsessions related to the COVID-19 virus [32].

2.3. Self-Care Questionnaire Related to Corona

This questionnaire was created by Pouyan Fard et al. and has 15 questions about self-care behaviors related to COVID-19 in the areas of social distancing, mask use, and hygiene behaviors on a five-point Likert scale from very low = 1, low = 2, average = 3, high = 4, to very high = 5. The highest and lowest scores obtained by respondents on this questionnaire are 75 and 15, respectively. Higher scores on this questionnaire indicate a higher level of self-care among people. The Cronbach's alpha of this scale has been reported by its creators as 0.87, and its validity has been evaluated and confirmed by psychologists. The reliability of this scale was obtained using the Cronbach's alpha method in the current study [33]. After collecting data, descriptive statistical methods (frequency, percentage, and mean \pm standard deviation) and inferential statistics, including the Chi-squared test and t-test for comparing two independent groups, were performed. The data were analyzed using SPSS version 21 software.

3. Findings

For statistical analysis, chi-square and t-tests were used to compare two independent groups on the research variables, and the results are reported in Tables 1 to 3. In this study, 362 people in two groups of diabetic patients with full vaccination and partial vaccination were examined. Table 1 relates to the descriptive statistics of variables in the two groups. Chi-square test results showed no statistically significant difference between the study groups in terms of age, sex, marital status, occupation, and education ($p > 0.05$). The mean age of the participants was 36 ± 1.64 years. The gender distribution in the group with full vaccination was male (54%), and the gender distribution in the group with partial vaccination was female (57%). Most of the people in the group with full vaccination were married (35%), and most of the people with partial vaccination were unmarried (39%). The most common occupation in the group with full vaccination was employee (35%), and the most common occupation in the group with partial vaccination was housewife (36%). The education level of people in the group with full vaccination was a diploma (32%), and the education level in the group with partial vaccination was also a diploma (30%). The means and standard deviations related to the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in two groups of diabetic patients with full vaccination and partial vaccination are described separately in Table 2.

Table 1. Descriptive statistics of demographic variables in two groups of diabetic patients with complete vaccination and incomplete vaccination

Group Variable	Variables	Complete vaccination	Incomplete vaccination	Value (chi-square scale)	Sig.
		Percent	Percent		
Age	18 to 29 years old	18%	16%	1.368	0.713
	30 to 39 years old	22%	25%		
	40 to 49 years old	34%	37%		
	50 to 59 years old	26%	22%		
Gender	Female	46%	57%	3.189	0.074
	Man	54%	43%		
Condition Marital status	Single	33%	39%	1.171	0.557
	Married	35%	29%		
	The Settlement	32%	32%		
Job	Employee	35%	33%	0.171	0.918
	Free	34%	31%		
	Housewife	31%	36%		
Education	Cycle to diploma	32%	21%	3.563	0.313
	Diploma	27%	30%		
	Associate Degree	20%	24%		
	Bachelor's degree and higher	21%	25%		

Table 2. Average score of dependent variables in two groups with complete vaccination and incomplete vaccination

Group Variable	Complete vaccination	Incomplete vaccination	Total
The resulting obsession of covid-19	8.02 ± 1.03	6.40 ± 0.84	362
Fear of covid-19	19.10 ± 0.99	15.70 ± 0.67	362
Self-care behaviors	48.40 ± 1.42	37.90 ± 1.52	362

Table 3. t-test comparing two groups on research variables

Variables	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
The resulting obsession of covid-19	4.269	18	0.000	1.80	0.4216	0.9141	2.6858
Fear of covid-19	8.946	18	0.000	3.40	0.3800	2.6015	4.1984
Self-care behaviors	15.890	18	0.000	10.50	0.6608	9.1116	11.8883

According to Table 3, the results of the t-test showed that there was a significant difference between the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in two groups with full vaccination and partial vaccination ($p < 0.05$). In addition, according to the means observed in Table 2, it can be argued that the mean values of the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in the groups with full vaccination were higher than in the group of people with partial vaccination.

4. Discussion

The present study was conducted with the aim of investigating the levels of obsession, fear, and self-care behaviors related to COVID-19 in fully vaccinated and partially vaccinated diabetic patients. Based on the results, there was a significant difference between the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in two groups with full vaccination and partial vaccination, such that the mean values of the variables of obsession caused by COVID-19, fear of COVID-19, and self-care behaviors in diabetic patients with full vaccination were higher than in the group of people with partial vaccination.

According to the findings, the variable of obsession was higher among the diabetic patients who were vaccinated than those who were not vaccinated. The results of this finding were consistent with the studies of Vellomorenno et al. [34], Rubin et al. [35], Dodd et al. [36], and Wheaton et al. [37]. Research showed that COVID-19 can cause symptoms of obsession and anxiety due to the physical problems and decrease in the quality of life of the patients [34]. It causes such symptoms as fear, anxiety, and mental-practical obsessions related to the disease [35]. People with diabetes are also more likely to receive the COVID-19 vaccine and avoid contracting the disease due to their low stress tolerance and because of the anxiety sensitivity and obsessive symptoms they experience related to their emotions [36]. In a study, Wheaton et al. examined the effects of the coronavirus pandemic on people's practical obsessive-compulsive symptoms. The results showed that obsessive symptoms have worsened in 76.2% of people. Most of the people were worried about getting infected with COVID-19 and thought about prevention and vaccination against COVID-19 more than other people in society [37].

In this study, the fear of COVID-19 was associated with a greater willingness to accept vaccination in diabetic patients,

which is consistent with the studies of Nazli et al. [38], Erdem et al. [39], Bendau et al. [31], and Salali et al. [40]. A common feature of fear and anxiety is that people tend to avoid what they fear. Hence, the most plausible explanation is that people with high levels of fear of COVID-19 are trying to avoid what they fear, namely, COVID-19, by getting vaccinated. Another explanation may be that the participants with higher levels of fear of the coronavirus consider COVID-19 as a threat to their health or their loved ones. Therefore, these participants are likely to be more willing to get vaccinated to protect themselves and their loved ones from COVID-19. However, there are inconsistencies in this field. For example, in Detoc et al.'s study [41], anxiety had a negative relationship with vaccine acceptance, and in Gotlib et al.'s study [42], anxiety had no significant relationship with vaccine acceptance. The reason for this inconsistency may be due to differences in culture, statistical population, sample size, and anxiety structure. As they measured general and widespread anxiety, in this type of anxiety, people are confused and indecisive and do not take any proactive action. But in specific anxiety situations such as COVID-19, where the issue is clear, the person takes constructive decisions (such as vaccination) to avoid it.

As the findings showed, the self-care behaviors in the group of people who got vaccinated were greater than those who didn't get vaccinated. This means that people who scored high on the self-care variables received more vaccines than others. The results of this finding were consistent with the results of Roshina et al. [43] and Yan et al. [44] and inconsistent with Tsai's research [45]. Self-care is the ability of a person to take care of themselves and try to maintain life, health, and well-being related to physical and social health [46]. Self-care is an important part of disease control and is a process that includes behavior and purposeful choices and reflects the attitude and knowledge of each individual. Maintaining one's health and life requires constant self-care and control. Implementing health-related self-care behaviors affects the individual. In fact, lifestyle changes are necessary to maintain health. Observing health behaviors is more common among people who value helping others [47]. Through active participation in the care processes, self-care leads to the improvement of public health, the improvement of quality of life, and ultimately reduces treatment costs. People who practice more self-care behaviors are more responsible and concerned about the disease and its spread to others. Therefore, self-care can lead people to accept vaccines. The inconsistency between the results of the present study and Tsai's study [45] can be attributed to the fear of unanticipated side effects of the vaccine and distrust towards it.

5. Conclusion

The presence of clinical psychologists and psychological interventions can be used in the design of care and treatment programs, including vaccination against contagious diseases such as the coronavirus, in order to increase self-care behaviors, reduce the fear and obsession of people with chronic diseases, including diabetes.

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Conflict of Interest

In this study, no conflicts of interest were reported by the authors.

Contribution of Authors

Conceptualization and design of the study (Ghodrati Torbati, A.), data collection (Abbaszadeh-Cheragheali, A.), analysis and interpretation of data (Ghodrati Torbati, A.), preparing a draft of the article or revising it to develop intellectual content (Fathi, H.), final approval of the manuscript before sending it to the journal.

Other References

- Pan, K.-Y., Kok, A. A. L., Eikelenboom, M., Horsfall, M., Jörg, F., Luteijn, R. A., et al. (2021). The mental health impact of the COVID-19 pandemic on people with and without depressive, anxiety, or obsessive-compulsive disorders: a longitudinal study of three Dutch case-control cohorts. *The Lancet Psychiatry*, 8(2).

References

1. ^aFlorek, D., Burmistrz, M., Potempa, J., & Pyrc, K. (2014). Stability of infectious human coronavirus NL63. *Journal of Virological Methods*, 205, 87-90.
2. ^{a, b, c}Sarmadi, M., Ghodrati-Torbati, A., Gazerani, A., Yaghoobi, H., & Bakhtiari-Dovvombaygi, H. (2021). Association of HIV/AIDS and COVID-19 variables: an ecological study. *HIV & AIDS Review. International Journal of HIV-Related Problems*, 20(2), 71-77.
3. ^{a, b}Torbati, A. G., Zandi, A., & Abbaspour, S. (2022). Effectiveness of educational intervention-based compassion therapy on emotional regulation and self-control after discharge of patients with COVID-19. *Journal of Education and Health Promotion*, 11.
4. ^aA, K., & S, A. (2020). Dealing with coronavirus anxiety and OCD. *Asian Journal of Psychiatry*, 51.
5. ^aWorld Health Organization. *Ten health issues*.
6. ^aPalamenghi, L., Barello, S., Boccia, S., & Graffigna, G. (2020). Mistrust in biomedical research and vaccine hesitancy: the forefront challenge in the battle against COVID-19 in Italy. *European Journal of Epidemiology*, 35(8), 785-788.
7. ^{a, b}Enea, V., Candel, O. S., Zancu, S. A., Scrumeda, A., Bărbușelu, M., Largu, A. M., et al. (2021). Death anxiety and burnout in intensive care unit specialists facing the COVID-19 outbreak: The mediating role of obsession with COVID-19 and coronaphobia. *Death Studies*.

8. ^{a, b}Caycho-Rodríguez, T., Vilca, L. W., Carbajal-León, C., Heredia-Mongrut, J., Gallegos, M., Portillo, N., et al. (2021). *Obsession with Covid-19 in Peruvian police and armed forces: Validation of the obsession with Covid-19 Scale in Spanish using SEM and IRT models. Death Studies.*
9. ^aSilva, R. M., Shavitt, R. G., & Costa, D. L. (2021). *Obsessive-compulsive disorder during the COVID-19 pandemic. Brazilian Journal of Psychiatry, 43(1).*
10. ^{a, b}Palamenghi, L., Barello, S., Boccia, S., & Graffigna, G. (2020). *Mistrust in biomedical research and vaccine hesitancy: the forefront challenge in the battle against COVID-19 in Italy. European Journal of Epidemiology, 35(8), 785-788.*
11. ^aKarimi, M., Zarei, T., Haghpanah, S., Azarkeivan, A., Naderi, M., Matin, S., Bazrafshan, A., Zahedi, Z., Shirkavand, A., Pishdad, P., & De Sanctis, V. (2022). *Efficacy and safety of Sinopharm vaccine for SARS-CoV-2 and breakthrough infections in Iranian patients with hemoglobinopathies: a preliminary report. Mediterranean Journal of Hematology and Infectious Diseases, 14(1).*
12. ^aBraun, P., Haffner, S., & Woodcock, B. G. (2020). *COVID-19 pandemic predictions using the modified Bateman SIZ model and observational data for Heidelberg, Germany: Effect of vaccination with a SARS-CoV-2 vaccine, coronavirus testing and application of the Corona-Warn-App. International Journal of Clinical Pharmacology and Therapeutics, 58(08), 417-425.*
13. ^aJain, S., & Jha, S. (2020). *Is age just a number: Exploring fear, anxiety, and coping in individuals during COVID-19. Indian Psychiatry Journal, 29(2).*
14. ^{a, b, c}Joensen, L. E., Madsen, K. P., Holm, L., Nielsen, K. A., Rod, M. H., Petersen, A. A., et al. (2020). *Diabetes and COVID-19: Psychosocial consequences of the COVID-19 pandemic in people with diabetes in Denmark – what characterizes people with high levels of COVID-19-related worries? Diabetic Medicine, 37(7), 1146-1154.*
15. ^aKozłowska, K., Walker, P., McLean, L., & Carrive, P. (2015). *Fear and the Defense Cascade. Harvard Review of Psychiatry, 23(4).*
16. ^{a, b}Basit, K. A., Zafar, A. B., Fawwad, A., Waris, N., Shaheen, F., & Basit, A. (2021). *Psychometric Analysis for fear of COVID-19 Scale (FCV-19S) and its association with depression in patients with diabetes: A cross-sectional study from a Tertiary Care Centre in Karachi, Pakistan. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 15(3), 733-737.*
17. ^{a, b, c}Musche, V., Kohler, H., Bäuerle, A., Schweda, A., Weismüller, B., Fink, M., et al. (2021). *COVID-19-Related Fear, Risk Perception, and Safety Behavior in Individuals with Diabetes. Healthcare, 9(4), 464.*
18. ^aLee, H.-J., & Kwon, S.-M. (2003). *Two different types of obsession: autogenous obsessions and reactive obsessions. Behaviour Research and Therapy, 41(1).*
19. ^{a, b}Joensen, L. E., Madsen, K. P., Holm, L., Nielsen, K. A., Rod, M. H., Petersen, A. A., et al. (2020). *Diabetes and COVID-19: Psychosocial consequences of the COVID-19 pandemic in people with diabetes in Denmark – what characterizes people with high levels of COVID-19-related worries? Diabetic Medicine, 37(7), 1146-1154.*
20. ^aThe Emerging Risk Factors Collaboration. (2010). *Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: A collaborative meta-analysis of 102 prospective studies. The Lancet, 375(9733).*
21. ^aDeshpande, S., Basavaraj, P., Ravi, G., Chandan, S., Mallikarjun, D., Chandan, S., et al. (2020). *Psychosocial impact*

of COVID-19. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(5), 779-788.

22. ^Kerner, W., & Brückel, J. (2014). Definition, classification and diagnosis of diabetes mellitus. *Experimental and Clinical Endocrinology & Diabetes*, 122, 384-386.
23. ^Fajar, J. K., Sallam, M., Soegiarto, G., Sugiri, Y. J., Anshory, M., Wulandari, L., Kosasih, S. A., Ilmawan, M., Kusnaeni, K., Fikri, M., & Putri, F. (2022). Global prevalence and potential influencing factors of COVID-19 vaccination hesitancy: A meta-analysis. *Vaccines*, 10(8), 1356.
24. ^Amirfakhræi, A., Masoumifard, M., Esmaeilshad, B., Dashtbozorgi, Z., & Darvish Baseri, L. (2020). Prediction of Coronavirus Anxiety based on Health Concern, Psychological Hardiness, and Positive Meta-emotion in Diabetic Patients. *Journal of Diabetes Nursing*, 8, 2423-5571.
25. ^Bala, R., Srivastava, A., Potsangbam, T., Anal, L., & Ningthoujam, G. D. (2021). Self-care practices and psychological distress among diabetic patients in Manipur during COVID-19: A scenario from the North East. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 15(1).
26. ^Abdelghani, M., Hamed, M. G., Said, A., & Fouad, E. (2021). Evaluation of perceived fears of COVID-19 virus infection and its relationship to health-related quality of life among patients with diabetes mellitus in Egypt during pandemic: a developing country single-center study. *Diabetology International*.
27. ^Monschein, T., Zrzavy, T., Löbermann, M., Winkelmann, A., Berger, T., Rommer, P., et al. (2021, July 7). Die Corona-Pandemie und Multiple Sklerose: Impfungen und deren Implikationen für Patienten – Teil 2: Impfstofftechnologien [The Corona Pandemic and Multiple Sclerosis: Vaccinations and Their Implications for Patients – Part 2: Vaccine Technologies]. *Der Nervenarzt [The Neurologist]*. Article in German.
28. ^Fajar, J. K., Sallam, M., Soegiarto, G., Sugiri, Y. J., Anshory, M., Wulandari, L., Kosasih, S. A., Ilmawan, M., Kusnaeni, K., Fikri, M., & Putri, F. (2022, August 19). Global prevalence and potential influencing factors of COVID-19 vaccination hesitancy: A meta-analysis. *Vaccines*, 10(8), 1356.
29. ^Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: Development and initial validation. *International Journal of Mental Health and Addiction*, 1-9.
30. ^Lee, S. A. (2020). How much “Thinking” about COVID-19 is clinically dysfunctional? *Brain, Behavior, and Immunity*.
31. ^{a, b}Bendau, A., Plag, J., Petzold, M. B., & Ströhle, A. (2021). COVID-19 vaccine hesitancy and related fears and anxiety. *International Immunopharmacology*, 97, 107724-107729.
32. ^Yaghoobi, A., Mameghani, S., Palanci, M., & Karimi, K. (2020). Validity and Reliability of the Obsession with the COVID-19 Scale. *Iranian Journal of War and Public Health*, 12(4), 235-240.
33. ^Pouyan Fard, S., Taheri, A. A., Ghvami, M., Ahmadi, S. M., & Mohammadpour, M. (2020). Individual, gender differences and corona: The relationship between personality traits and gender differences with corona self-care behaviour. *Shenakht Journal of Psychology & Psychiatry*, 7(4), 67-77.
34. ^{a, b}Valero-Moreno, S., Lacomba-Trejo, L., Casaña-Granell, S., Prado-Gascó, V. J., Montoya-Castilla, I., & Pérez-Marín, M. (2020, February 3). Psychometric properties of the questionnaire on threat perception of chronic illnesses in pediatric patients. *Revista Latino-Americana de Enfermagem*, 28.
35. ^{a, b}Rubin, G. J., & Wessely, S. (2020, January 28). The psychological effects of quarantining a city. *BMJ*, 368.
36. ^{a, b}Dodd, R. H., Pickles, K., Nickel, B., Cvejic, E., Ayre, J., Batcup, C., Bonner, C., Copp, T., Cornell, S., Dakin, T., &

- Isautier, J. (2021, February 1). Concerns and motivations about COVID-19 vaccination. *The Lancet Infectious Diseases*, 21(2), 161-163.
37. ^{a, b}Wheaton, M. G., Messner, G. R., & Marks, J. B. (2021, January 1). Intolerance of uncertainty as a factor linking obsessive-compulsive symptoms, health anxiety and concerns about the spread of the novel coronavirus (COVID-19) in the United States. *Journal of Obsessive-Compulsive and Related Disorders*, 28, 100605.
38. [^]Nazlı, Ş. B., Yiğman, F., Sevindik, M., & Deniz Özturan, D. (2022). Psychological factors affecting COVID-19 vaccine hesitancy. *Irish Journal of Medical Science*, 191(1), 71-80.
39. [^]Erdem, D., & Karaman, I. (2022). Impact of coronaphobia on attitudes and acceptance towards COVID-19 vaccine among cancer patients: A single-center study. *Future Oncology*, 18(4), 457-469.
40. [^]Salali, G. D., & Uysal, M. S. (2020). COVID-19 vaccine hesitancy is associated with beliefs on the origin of the novel coronavirus in the UK and Turkey. *Psychological Medicine*, 19, 1-3.
41. [^]Detoc, M., Bruel, S., Frappe, P., Tardy, B., Botelho-Nevers, E., & Gagneux-Brunon, A. (2020). Intention to participate in a COVID-19 vaccine clinical trial and to get vaccinated against COVID-19 in France during the pandemic. *Vaccine*, 38(45), 7002-7006.
42. [^]Gotlib, J., Jaworski, M., Wawrzuta, D., Sobierajski, T., & Panczyk, M. (2021). Impact of anxiety on readiness for COVID-19 vaccination among Polish nursing undergraduate students: Nationwide cross-sectional study. *Vaccines*, 9(12), 1385-1398.
43. [^]Roshchina, Y., Roshchin, S., & Rozhkova, K. (2022). Determinants of COVID-19 vaccine hesitancy and resistance in Russia. *Vaccine*, 40(39), 5739-5747.
44. [^]Yan, E., Lai, D. W., & Lee, V. W. (2021). Predictors of intention to vaccinate against COVID-19 in the general public in Hong Kong: findings from a population-based, cross-sectional survey. *Vaccines*, 9(7), 696.
45. ^{a, b}Tsai, F. J., Yang, H. W., Lin, C. P., & Liu, J. Z. (2021). Acceptability of COVID-19 vaccines and protective behavior among adults in Taiwan: associations between risk perception and willingness to vaccinate against COVID-19. *International Journal of Environmental Research and Public Health*, 18(11), 5579.
46. [^]Cook-Cottone, C. (2016). Embodied self-regulation and mindful self-care in the prevention of eating disorders. *Eating Disorders*, 24(1), 98-105.
47. [^]Böhm, R., Betsch, C., & Korn, L. (2016). Selfish-rational non-vaccination: Experimental evidence from an interactive vaccination game. *Journal of Economic Behavior & Organization*, 131, 183-195.