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Research Paper

Developing a causal model of Family function based on psychological Hardiness through Persistent psychological symptoms post-COVID-19 Syndrome

Mahnoosh Mohrehkesh [1], **Faramarz Sohrabi** [2*], **Ahmad Borjali** [2] & **Noor Ali Farrokhi** [3]

1. Ph.D. student. Psychology Department, Educational and Psychology, Allameh Tabataba'i, Tehran, Iran.
2. Professor, Clinical Psychology Department, Educational and Psychology, Allameh Tabataba'i, Tehran, Iran.
3. Professor, Evaluating and Measuring Department, Educational and Psychology, Allameh Tabataba'i, Tehran, Iran.

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ABSTRACT

Objective: Family functioning is one of the structures that can have a significant impact on the psycho-social functioning of its members. For this reason, identifying the factors affecting it will greatly help to improve the family's performance. The purpose of the current research was to develop a causal model of Family function based on psychological Hardiness and Psychological capital through Persistent psychological symptoms post-COVID-19 Syndrome.

Methods: The statistical population of the present study was men and women of Karaj and Tehran provinces in 2023 who had at least one history of contracting COVID-19. From the statistical population, using an available sampling method, 395 eligible individuals were selected to participate in the research and complete the research questionnaires. In this research, Kobasa's Psychological Hardiness questionnaires, Depression, Anxiety, and Stress Scale (DASS-21), Corona Disease Anxiety Scale (CDAS), Corona Stress Scale (CSS-18), suitable for the Iranian lifestyle, and the Questionnaire of Family Functioning were used. The collected data were analyzed using the structural equation analysis method in Amos software (0.084).

Results: The findings of this research indicated that Psychological Hardiness directly (0.085) and indirectly through psychological symptoms after COVID-19 ($p<0.05$) was able to significantly predict family functioning.

Conclusion: According to the findings of this research, it seems that strengthening personal psychological structures in the face of environmental stressors can improve people's performance in dealing with these conditions.

1. Introduction

The family, as the most fundamental and universal social institution, has been recognized by the World Health Organization (WHO) as the primary social determinant of health and well-being (Gholamzadeh Bafghi & Jamali Bafghi, 2018). It serves as a sanctuary for preserving individuals' physical and mental health and shields its members from external pressures (Xiang, Chan, Hu, et al., 2023), thereby playing a pivotal role in their overall well-being (Shuai, Chan, Hu, et al., 2022). Family functioning, encompassing the dynamics of member interactions, relationship maintenance, and decision-making processes, exerts a profound influence

***Corresponding Author:**
Faramarz Sohrabi
Address: Clinical Psychology Department, Educational and Psychology, Allameh Tabataba'i, Tehran, Iran.
E-mail: asmar567@yahoo.com

on individual and societal outcomes (Silburn, Zubrick, De Maio et al., 2006). It can be conceptualized as a multifaceted construct reflecting the interplay of family members in pursuing shared goals and outcomes (Tye-Murray, 2019). Portes, Howell, Brown, et al. (1992) define family functioning as the family's ability to adapt to changing circumstances throughout its life cycle, resolve conflicts, foster cohesion among members, and effectively implement disciplinary patterns and maintain boundaries between individuals, all aimed at preserving the family system.

According to the results of many studies, the family and especially the functioning of the family can play a very important and influential role in the problems and mental injuries of the family members. Family functioning can affect individual well-being and increase the quality of life for all individuals by increasing the level of social support in families, which helps them face and solve crises and traumas in a better way. (Sheidow, Henry, Tolan & Strachan, 2014; Kohan, Heidari, and Keshvari, 2016; Nasiri, Peivastegar, and Derakhshani, 2013; Diamond, Brimhall & Elliott, 2018; Malehmir, Mikaeli, & Narimani, 2023).

Tensions can sometimes hinder the healthy functioning of the family. The COVID-19 pandemic is one of the events that has severely affected the family and its functioning in recent years. This viral disease was first observed in Wuhan, China, in 2019, and in a short period of time, it spread all over the world and became the biggest pandemic of the 21st century (World Health Organization, 2020). This syndrome not only brought many physical symptoms to the sufferers, but through creating uncertainty and confusion in the sufferers (World Health Organization, 2020), it brought unbearable psychological pressure to the people involved, a psychological pressure that in many cases led to the experience of anxiety, stress, depression, unresolved grief, and post-traumatic stress disorder (Farnosh et al., 2020). On the other hand, when the family is faced with stressful situations such as disease outbreak, the financial stress of the members increases and family and social relations decrease, and as a result, the irritability and isolation of people and on the other hand, as a result of the restrictions caused by the quarantine that as a result, those individuals lost close relationships outside the family and had limited access to psychological services (Guo, Cao, Hong et al., 2020). According to the neuropsychology outlook, enduring a potentially fatal disease and stress-related inflammation caused by infection in the immune system can specifically strengthen psychopathology and increase mental stress (Miller & Raison, 2016). In addition, immune mechanisms, fear of illness, uncertainty about the future, stigma, traumatic memories of severe illness, and social isolation experienced by patients during COVID-19 are significant psychological stressors that may have interacted in defining the psychopathological outcome. (Brooks, Webster, Smith et al., 2020; de Medeiros Carvalho, Moreira, Oliveira et al., 2020).

The psychological consequences of the coronavirus are very wide and diverse, similar to those of other diseases, and the most knowledge about these consequences is obtained through research conducted after similar epidemics, such as the SARS epidemic in 2003 or the SARS epidemic in 2013. Jacobs, Gourna Paleoudis, Lesky-Di Bari et al. (2020) showed that in Hong Kong in 2003, after the SARS epidemic, patients with this disease in most cases reported increased post-traumatic stress, feelings of helplessness and worry, sleep problems, smoking, and alcohol addiction. Also, a number of studies have documented post-traumatic stress symptoms in the United States and France (Cardenas et al., 2011). Another study also showed that the survivors of the SARS virus experienced several psychiatric symptoms, including post-traumatic stress disorder (PTSD), depression, panic disorder, and obsessive-compulsive disorder (OCD), and reduced quality of life in addition to the physical symptoms of the virus (Wu, Xu, Chen, et al., 2020; Cheng, Wong, Tsang, et al., 2004; Lam, Wing, Yu, et al., 2009).

In similar epidemics, research has shown that the psychological effects caused by SARS disease have affected patients for a long time after infection and even after recovery, and in some cases, these symptoms have remained with recovered patients for more than half a decade. Considering the scattered early studies on COVID-19 and the previous evidence on SARS and MERS outbreaks, it can be assumed that the survivors of COVID-19, like the survivors of SARS and MERS, are affected by long-term psychological symptoms caused by the disease. Furthermore, the long-term effects of these consequences will significantly impact the lives of survivors for an extended period (Rogers et al., 2020; Wu et al., 2020; Troyer, Kohen & Hong, 2020; Brooks et al., 2020). Increased awareness of persistent symptoms among COVID-19 patients has even led to the “prolonged COVID” designation, which is not yet clearly defined. The Association for Health and Care Excellence (NICE) suggests using the definition of "persistent symptomatic COVID-19" for symptoms lasting between 4 and 12 weeks after acute onset and "post-COVID-19 symptoms" for symptoms lasting more than 12 weeks (Bliddal et al., 2021). Therefore, in December 2020, the National Institute for Health and Care Excellence (NICE) presented a special guideline for managing the long-term effects of COVID-19, which included "post-COVID-19 symptoms" indicator signs (Garbi, 2021).

In this guideline, the most important psychological symptoms that are usually observed in post-COVID-19 symptoms are anxiety, depression, and post-traumatic stress, and it is stated that these three symptoms together constitute "post-COVID-19 psychological symptoms. "As mentioned earlier, this syndrome can significantly affect family functioning through the continuation of financial stress and other lasting psychological effects, an issue that has been neglected in post-coronavirus pandemic research and needs to be addressed in further reviews. Despite the proof of the psychological effects of COVID-19 in the form of psychological symptoms after COVID-19, the different psychological symptoms and reactions even among patients who reported similar levels of involvement with the disease highlight the possibility that the psychological symptoms associated with the disease and thus "post-COVID-19 psychological symptoms" may be rooted in contextual variables and structures. In this regard, professionals and researchers can benefit from a better understanding of the factors that differentiate between people who succumb to stress-related problems and those who show more flexibility in the face of problems, thereby reducing or preventing these issues. One of the most important variables that explains this distinction is psychological hardiness.

One of the pathways through which post-COVID-19 psychological symptoms impact family functioning is through individuals' psychological capacity (Wu, Xu, Chen, et al, 2020). In other words, individuals' psychological capacity can shape their responses to stressors such as COVID-19 and, in turn, mediate their subsequent functioning in various domains, including family functioning. Psychological resilience is one of the influential constructs within psychological capacity.

Psychological hardiness helps people to evaluate stressful health-related situations as simply challenging situations that require effort to manage, instead of seeing them as problems beyond their control (Kowalski & Schermer, 2019), and that is why it is referred to as a source of resistance to dealing with stressful and challenging events (Pandey & Shirvastava, 2017). People who report high Psychological Hardiness usually consider health-related limitations and challenges as an opportunity for growth and thus are more committed to their behaviors and feel more in control of their lives (Bartone & Homish, 2020). Psychological Hardiness itself consists of three related dimensions: control, commitment, and coping. Kobasa et al. (1983) describe the elements of hardiness control as the tendency to believe that one can influence the events one encounters (Kowalski & Schermer, 2019). One of the effects of psychological toughness on the performance of parents, as the most important building blocks of any family, is determining how parents react to the demands of family members and, particularly, children. These effects were especially evident during the Corona era (Salehzadeh, Shokri, & Fathabadim et al., 2023). Perception of control influences stress resistance because events and actions are more perceived as natural consequences of one's actions than as unexpected and stressful experiences. In the case of COVID-19, this factor reduces the likelihood of an uncontrollable perception of the disease, thereby mitigating its psychological effects through appropriate preventive or therapeutic measures. This leads to a commitment to activities that increase resistance to stressors, as committed individuals are less likely to give up under pressure. The coping dimension transforms the cognitive appraisal of a potentially stressful situation from a negative evaluation to a positive one, viewing it as an opportunity for growth and conquest. In the studies by Kobasa (1979) and Kobasa et al. (1983), it has been shown that low Psychological Hardiness is associated with experiencing higher levels of stress and, as a result, increasing the likelihood of disease. Research has also shown that the impact of Psychological Hardiness can be greater than even exercise and social support (Kowalski & Schermer, 2019). Other research has described Psychological Hardiness as one of the important factors in predicting active and purposeful coping strategies (Hanton, Neill & Evans, 2013), and it can also affect physical health or physical illness (Taylor et al., 2013). In some research, the relationship between Psychological Hardiness and anxiety has been discussed, and the results have indicated a negative and significant relationship between toughness and anxiety (Reknes & Harris, 2018; Kovács & Borcsa, 2017; Hadadnia, 2018). Also, other researchers state that anxiety, and especially coronavirus anxiety, is one of the most important factors that can lead to people being more vulnerable to various physical diseases. In relation to the relationship between Psychological Hardiness and the symptoms of the coronavirus, research has also been conducted. The results of these studies have indicated that Psychological Hardiness has a negative and significant relationship with anxiety, stress, and depression in Corona patients (Falah, MihanDost, and Mami, 2020; Malehmir, Nozari, & Rafieerad et al., 2021).

Despite the significant impact of psychological hardiness on post-COVID-19 psychological symptoms and the undeniable effects of post-COVID-19 psychological symptoms on family functioning, no research has yet examined the mediating role of post-COVID-19 psychological symptoms in the relationship between psychological hardiness and family functioning. Therefore, the present study aims to investigate the causal model of family functioning based on psychological hardiness with the mediation of post-COVID-19 psychological symptoms.

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2. Materials and Methods

The current research is correlational and descriptive in terms of both its applied purpose and data collection method. The current research population consists of all men and women who were infected with COVID-19 at least once during the COVID-19 pandemic, specifically between 2019 and 2021, and reside in Tehran or Karaj. In order to estimate the sample size in the current research, the sample size estimation formula (G-Power) was used in structural equations. In this method, the sample size is calculated according to the parameters of effect size, test power, number of hidden variables, number of obvious variables, and significance level. In the present study, according to the effect size (average effect size equal to 0.19), test power (0.80), the number of hidden variables (5 variables) and the number of obvious variables (questions), the minimum sample size required to achieve the effects A significant number of 395 people was estimated, therefore, in the current research, 395 people from the community members who met the criteria to enter the research, will be selected and placed in the sample group using the accessible sampling method. Then they will respond to the research tools.

The most important entry criteria in the present study are: 1. Being married, 2. Being in the age range of 20 to 65 years old, 3. Having at least 1 infection with the COVID-19 disease, 4. At least 12 weeks have passed since contracting the COVID-19 disease 5. Not taking psychiatric drugs. Also, the most important criteria for dropping out of the study are: 1. The person's desire to withdraw from the study.

Kobasa's Psychological Hardiness Questionnaire: Kobasa's Psychological Hardiness Questionnaire (1970) will measure Psychological Hardiness in the present study. This questionnaire has 50 items and consists of three subscales of challenge, commitment, and control. Answering each of these items involves selecting one of the options, ranging from completely disagreeing to completely agreeing. In the research of Kobasa, Madi, and Zoola (1983), the validity of subscales of commitment, challenge, and control has been reported at 0.85, 0.71, and 0.70, respectively. Also, in Madi's (2002) research, the internal consistency for the control, commitment, and challenge subscales was 0.84, 0.75, 0.71, and 0.88 for the whole scale. Cronbach's alpha of the Psychological Hardiness questionnaire in the present study was 0.827, which indicates the good reliability of this tool.

Depression, Anxiety and Stress Scale-(DASS-21): In order to measure depression in this research, the Depression, Anxiety and Stress Scale-(DASS-21) will be used. This questionnaire was prepared by Lovibond in 1995 (Crawford & Henry, 2003) and has 21 items, of which depression is measured by seven separate items. The highest score of depression in this questionnaire is 21, and grading is done on three scales: normal (0 to 4), moderate (5 to 11), and severe (more than 12). The validity and reliability of this questionnaire have been validated in Iran by several researchers (Aazami, Khanjani, & Sadr, 2017). Azami et al. (2017) demonstrated that the three-factor model of the questionnaire was confirmed by confirmatory factor analysis in a sample of university students. Additionally, this study found that the scale had a significant negative correlation with the Ryff Psychological Well-being Scales. Finally, the results of the study indicated that the interpretation of the latent constructs of the questionnaire was consistent between girls and boys, allowing for the use of the same analysis for both sexes. In the present study, the Cronbach's alpha for the depression questionnaire was 0.736, indicating the satisfactory reliability of this instrument.

Corona Disease Anxiety Scale (CDAS): This questionnaire was used by Alipour et al. (2020) and Aghili and Rahat Ramroudi (2021) to measure the anxiety caused by the spread of the coronavirus in Iran. The final version of this tool had 18 items and two components. Items 1 to 9 were related to the psychological symptom's component, and items 10 to 18 were related to the physical symptom's component. The highest and lowest scores that people get in this questionnaire are between 0 and 54. People with high scores on this questionnaire indicate higher levels of anxiety caused by COVID-19. The reliability of this tool using Cronbach's alpha method was equal to 0.88 for the mental symptoms factor and 0.86 for the physical symptoms factor. Also, the total Cronbach's alpha coefficient of the questionnaire was equal to 0.92 (Aghili & Rahat Ramroudi, 2021). Additionally, the researchers assessed the validity of the questionnaire by conducting exploratory and confirmatory factor analysis, as well as evaluating its content and appearance. As a result, 18 out of the initial 23 items were included in the final version of the questionnaire (Aghili & Rahat Ramroudi, 2021). Cronbach's alpha of the anxiety questionnaire caused by the spread of the coronavirus in the present study was equal to 0.795.

Corona Stress Scale (CSS-18) suitable for the Iranian lifestyle: This questionnaire was created by Salimi, Abedini Chamgordani, Ghasemi Nafchi, and Tabashir (2021) to measure the amount of stress caused by Corona in Iranian culture.This questionnaire has 18 items and three subscales of mental states of stress, physical states of stress, and behaviors related to stress. Salimi et al. (2020) showed in their research that Cronbach's alpha coefficient of three subscales of psychological states of

stress, physical states of stress, and behaviors related to stress were reported as 0.92, 0.82, and 0.57, respectively, and Cronbach's alpha of the whole questionnaire was reported as 0.91. Also, these researchers stated that the results of the validity study showed that there is a positive and significant correlation between this questionnaire and the Dass-21 questionnaire. Cronbach's alpha of this questionnaire in the present study was equal to 0.737.

The Questionnaire of Family Functioning: The Questionnaire of Family Functioning was prepared by Epstein et al. (1983), and its purpose is to measure family performance based on the McMaster model. This model determines the structural, occupational, and interactive characteristics of the family and specifies six dimensions of family functioning. These dimensions include problem-solving, communication, roles, emotional companionship, emotional integration, behavior control, and overall family functioning. It also specifies the family's ability to compromise with family duties on a five-point Likert scale as completely agree (5), agree (4), to some extent (3), disagree (2), and completely disagree (1). The reliability of the family functioning questionnaire has been examined and confirmed in various research studies. Cronbach's alpha coefficients of the whole scale and subscales of problem-solving, communication, roles, emotional companionship, emotional fusion, behavior control, and overall performance in the research of Sanaei and Amini (2000) have been reported as, respectively, 0.92, 0.61, 0.38, 0.72, 0.64, 0.65, 0.61, and 0.81. The same Cronbach's alpha coefficients for the whole scale and its subscales in the research of Sanaei and Amini (2000) also showed that the family assessment tool had concurrent validity and good prediction. In addition, this instrument, with the power of differentiating family members, has good validity for known groups in all seven of its subscales. Amanelahi, Attari, and Khojasteh Mehr (2010) used the method of halving and Cronbach's alpha to calculate the reliability coefficient of the above scale. They obtained a coefficient of 0.71 and Cronbach's alpha of 0.80 for this questionnaire. These researchers also used a general question on a 7-point Likert scale to calculate the validity of the above result. The correlation between the total score of the test and the total number of questions was 0.33, and the mean level of its property was 0.002. Cronbach's alpha of the joint performance questionnaire in the present study was equal to 0.633.

3. Results

The descriptive findings indicated that 41.77% of the 395 participants were male and 58.23% were female. Also, the average and standard deviation of the age of the participants were (6.78–29.03) among women and (8.56-39.93) among men. Descriptive information related to research variables and each of their subscales is presented in Table 1.

Table 1. Mean, standard deviation, skewness, and elongation of research variables

Variable	Component	M	Standard Deviation	skewness	elongation
Psychological Hardiness	Obligation	24/78	5/64	-0/228	0/120
	Control	20/49	5/51	-0/766	0/120
	Struggle	12/3	3/34	-1/046	0/522
	Total score	57/59	11/98	-0/653	0/549
Anxiety caused by Corona	Depression	7/41	3/44	0/656	0/129
	Mental anxiety	11/49	3/61	-0/416	0/470
	Physical anxiety	8/64	4/34	0/75	0/659
	Total score	20/14	6/42	0/137	0/471
Corona	Mental states	17/29	3/85	-0/073	-0/155
	Physical states	6/06	2/82	0/154	-0/640
Stress	Stress-related behaviors	6/71	1/94	-0/103	-0/164
	Total score	30/07	6/10	-0/162	-0/040
Family Function	Solve the problem	12/84	3/16	0/261	-0/216
	Roles	22/63	3/88	0/306	-0/372
	Emotional companionship	15/97	4/01	0/609	0/251
	Emotional conflict	19/03	5/17	0/672	1/327
	General performance	26/71	6/42	0/973	1/438
	Relationship	14/35	3/67	1/110	1/779
	Behavioral control	18/89	4/74	0/438	0/060
	Total score	130/45	20/13	1/295	1/830

In order to test the "causal model of family functioning based on Psychological Hardiness with the mediation of post-COVID-19 symptoms," the structural equation analysis method was used in the Amos software platform. In this model, Psychological Hardiness is an exogenous (independent) hidden variable with three indicators, namely commitment, control, and struggle; the variable of depression is an obvious endogenous variable (mediator); The corona anxiety variable is an obvious endogenous variable (mediator) with two indicators,

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namely mental anxiety and physical anxiety; Corona stress variable as an endogenous variable (mediator) with three indicators, i.e., psychological states of stress, physical states of stress, and stress-related behaviors; and finally, family function variable as a hidden endogenous (dependent) variable with six indicators, i.e., problem-solving, role emotional companionship, emotional involvement, general functioning, communication, and behavioral control are defined (Chart 1).

Table 2 shows the fit index of the model. As can be seen, the original model designed by the researcher did not have a good fit. Therefore, to obtain good fit indices, the model was modified (Chart 2).

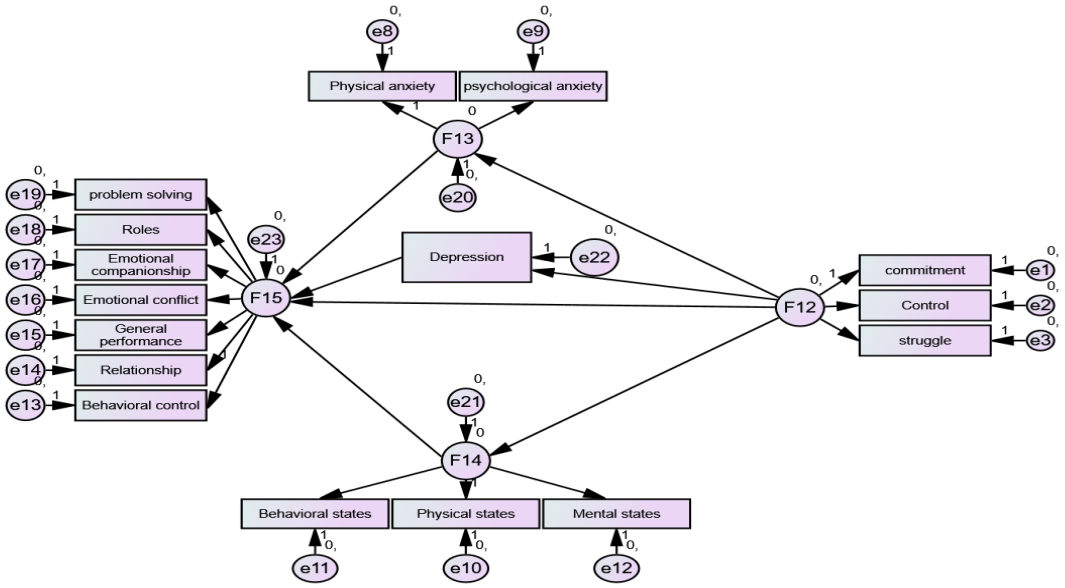

Figure 1. **Causal model of family functioning based on Psychological Hardiness with the mediation of post-COVID-19 symptoms**

Table 2. **Model fit indices**

Indicators	Scope of acceptance	The original model	Modified model	
			Add *e*18 ↔ *e*14 Add *e*19 ↔ *e*16 Add *e*21 ↔ *e*16 Add *e*19 ↔ *e*18	Add *e*22 ↔ *e*8 Add *e*17 ↔ *e*12 Add *e*18 ↔ *e*13 Add *e*19 ↔ *e*13 Add *e*16 ↔ *e*14
NPAR	-	54	63	
CMIN	-	1189/080	174/158	
DF	-	98	89	
P	-	0/001	0/001	
CMIN/DF	1 - 5	12/133	1/957	
RMSEA	< 0.07	0/167	0/049	
PNFI	> 0.5	0/420	0/689	
CFI	> 0.9	0/531	0/963	
NFI	> 0.9	0/514	0/929	
TLI	> 0.9	0/526	0/951	
RFI	> 0.9	0/504	0/904	
IFI	> 0.9	0/535	0/964	

The fitted model has 9 more paths than the original model. All the new routes added were based on the proposal presented in the model (Figure 2).

After modifying the model, the direct and indirect effects of the variables were examined (Table 3). According to the results of Table 3 and Graph 2, it can be seen that Psychological Hardiness has a significant effect ($p<0.05$) directly (0.084) and indirectly through depression, coronavirus anxiety, and coronavirus stress (0.085) on family functioning.

Table 3. **Direct and indirect effects of research variables on family functioning**

Independent	Dependent		Depression	Corona anxiety	Corona stress	Family function
		direct impact	-0/218	-0/322	-0/095	0/084
Psychological	**Hardiness**	Indirect effect	-	-	-	0/085
		total effect	-0/218	-0/322	-0/095	0/170

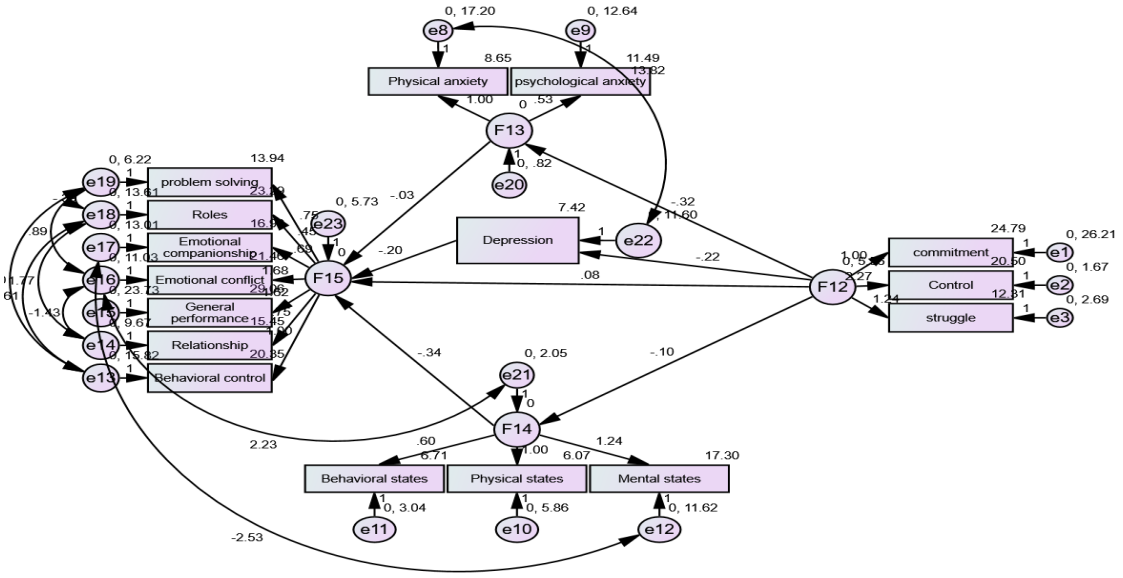

Figure 2. **Causal model of family functioning based on Psychological Hardiness with the mediation of post-COVID-19 symptoms**

4. Discussion and Conclusion

The present study was conducted to develop a causal model of family function based on psychological hardship and psychological capital through persistent psychological symptoms post-COVID-19 syndrome. The results of the current research indicated that, by adding a number of paths, the causal model of the research has a favorable fit. In other words, these results showed that Psychological Hardiness can directly and indirectly predict family functioning through psychological symptoms after COVID-19. These results also showed that the direct effect of Psychological Hardiness on positive family functioning and the psychological symptoms of post-COVID-19 syndromes is negative and significant ($p<0.05$). The findings of the present study are consistent with those of previous studies conducted by Zahadat and Omidvar (2017), Karatepe and Talebzadeh (2016), Reknes, Harris, and Inauen (2018), and Kovács and Bursa (2017). Zahadat and Omidvar (2016), in line with the findings of the present study, demonstrated that psychological hardiness can significantly predict individuals' ability to control various aspects of their lives. Karatepe and Talebzadeh (2016) also argued in their study that psychological hardiness can have a direct impact on individuals' ability to control their thoughts, emotions, and even behaviors, thereby influencing their overall performance. These findings indirectly align with the results of the present study. Liu et al. (2020) pointed to the influence of psychological hardiness, alongside psychological capital, on individuals' performance in various dimensions, both directly and indirectly, through the creation of a sense of control over thoughts, emotions, and behaviors.

Healthy family functioning means the family's ability to create complementarity between members, mutual externalization of members with other needs, having clear and flexible boundaries, and the ability to resolve conflicts and create changes appropriate to the family life cycle (Minuchin, 1981). Therefore, any factor that disrupts the balance of the family and causes tension beyond the family's ability to manage can cause problems in the family's functioning. One of the most important stressful factors in recent years, which has been able to significantly affect family functioning by creating psychological distress, was the COVID-19 pandemic, which affected the lives of people who were directly or indirectly involved in this disease. The COVID-19 pandemic has particularly affected individuals who reported psychological symptoms after contracting the disease, due to the severity of mental injuries caused by it. Previous research has focused more on explaining the relationship between these symptoms and family functioning in the context of similar diseases, such as SARS in 2002, rather than in relation to the COVID-19 disease. The experiences related to these diseases indicate that the lasting psychological effects of these diseases can have a destructive effect on the family functioning of sufferers and even those who have recovered.

Similar to SARS, but on a far more extensive scale, COVID-19 has triggered a wide range of social impacts, including school and university closures, widespread job losses, social distancing measures, and other stringent restrictions. These limitations have thrust many families into a state of emergency, leading to a surge in reported cases of domestic abuse. Violence against children, spouses, and other family members has been on the rise, indicating that the deadly virus has taken a toll on countless households (Luetke et al., 2020; Panzeri et al., 2020).

These impacts stem from the fear and anxiety associated with contracting COVID-19, on the one hand, and the economic pressures and unemployment that have ensued, on the other. The economic strains have brought financial crises upon families, impairing family functioning. Over time, the deteriorating economic conditions have exacerbated the effects on family functioning, acting as both an independent and COVID-19-dependent factor. These circumstances mirror those discussed in the family stress theory (Moreira & Costa, 2020). This theory posits that adverse economic conditions, particularly income loss and financial strain, can also negatively impact family satisfaction and functioning (Moreira & Costa, 2020). The impacts of COVID-19 on family functioning, both direct and indirect through its effects on family economic conditions, have persisted not only during the peak of the pandemic but also in its aftermath due to the emergence of post-COVID-19 psychological symptoms.

Uncertainty and confusion surrounding the implications and recovery from COVID-19 have been identified as significant contributors to post-COVID-19 symptoms (World Health Organization, 2020). This uncertainty and confusion serve as sources of psychological stress, which can manifest in various post-COVID-19 symptoms, including psychological ones (Farnosh et al., 2020). This stress stems from the perceived threat to one's well-being, as outlined in the Conservation of Resources (COR) theory (Hobfoll, 1989). Despite the shared or relatively similar experiences of the COVID-19 pandemic, individuals reported varying levels of psychological stress and, consequently, varying intensities of post-COVID-19 symptoms. One potential explanation for this disparity lies in the individual differences in psychological hardiness. Individuals with low resilience demonstrate less control over their situations, leading to heightened anxiety and stress due to perceived resource scarcity (Reknes, Harris, & Einarsen, 2018). This anxiety can further intensify due to a lower threshold for appraising situational cues as threatening (Kobasa, 1979). In contrast, individuals with high psychological resilience tend to experience lower levels of anxiety, even in the face of similar stressors. This resilience stems from a higher threshold for perceiving situations as threatening and a greater sense of preparedness to cope with such threats (Connor & Davidson, 2003). As a result, psychological resilience appears to empower individuals to adopt a more adaptive approach to stressful events, engaging with them rather than succumbing to anxiety, stress, or depression. This adaptive approach involves actively seeking to overcome challenges and transform unfavorable situations into more favorable ones. The role of psychological resilience in mitigating the impact of COVID-19 post-symptoms highlights the importance of fostering resilience-building strategies, particularly during challenging times like pandemics. By enhancing individuals' capacity to cope with adversity, these strategies can promote psychological well-being and reduce the burden of post-COVID-19 symptoms. Under such circumstances, the negative effects of stressful situations such as contracting COVID-19 are mitigated (Hystad, Eid, Johnson, et al., 2010), and individuals' mental health is better preserved (Eschleman, Bouling, & Arkon, 2010). In general, it can be stated that psychological hardiness, by enhancing the level of resilience, equips individuals with capabilities that they can rely on to manage stressful situations more effectively, thereby reducing their levels of anxiety, stress, and depression when faced with unfamiliar and ambiguous situations such as contracting COVID-19. On the other hand, it can be expected that psychological hardiness, by reducing post-COVID-19 psychological symptoms, will also have an impact on their family functioning, leading to an improvement in family functioning, especially for those who are more at risk of these symptoms due to illness.

The present study, like any other research endeavor, faced certain limitations. Among the most notable limitations are the restricted sample size, the limitations associated with the use of self-report questionnaires, and the limitations of the research model, which preclude the establishment of causal relationships. In this regard, it is suggested that future research could yield more reliable results if researchers were to employ larger sample sizes and utilize a wider range of data collection instruments. Additionally, the examination of demographic variables and their role in the association between COVID-19 psychological symptoms and their outcomes could be a valuable area of exploration in future studies.

5. Ethical Considerations

Compliance with ethical guidelines

Compliance with ethical guidelines, all ethical principles were considered in this article. The participants were informed about the purpose of the research and its implementation stages. They were also assured of the confidentiality of their information and were free to leave the study at any time. If desired, the research results would be made available to them.

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Authors' contributions

All authors have participated in the design, implementation, and writing of all sections of the present study.

Conflicts of interest

The authors declared no conflict of interest.

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