



Psychological Effects of COVID-19 Lockdown on Family Members; a Qualitative Study

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ABSTRACT

Aims Major traumatic events such as the COVID-19 pandemic and the related lockdown can affect the family as the fundamental unit of all societies. This study aimed to explain family members' psychological experiences of the COVID-19 lockdown.

Participants & Methods This qualitative study was conducted from October 2020 to February 2021 on Public population living in Khorramabad, Iran. The sample size that achieved data saturation was 29 by purposive sampling. Unstructured in-depth interviews were used to collect the data. The inductive content analysis approach proposed by Graneheim & Lundman was used to analyze the data.

Findings Both positive (movement toward the expansion of the worldview and a sense of pleasure and happiness) and negative (anxiety, a sense of isolation, intensification of loneliness, mood and energy changes, hardship and fatigue from lockdown, boredom, anger, depression, disruption of the sleep-wake patterns, being fed up with limitations, feelings of helplessness, more frequent family disputes and arguments and Internet abuse) psychological aspects were recognized, each of which had some subcategories.

Conclusion The COVID-19 pandemic lockdown created negative and disruptive experiences and positive and constructive experiences for different individuals.

Keywords Psychological Experiences; Family; COVID-19; Quarantine; Qualitative Research

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Introduction

The COVID-19 pandemic has led to high morbidity and mortality rates as well as many changes and complications in daily life [1]. To reduce the prevalence of coronavirus disease (COVID-19) worldwide, governments urge their citizens to keep their physical distance and stay home to prevent the spread of COVID-19 [2-4]. Nations have implemented locked downs to enforce social distancing as a measure to curb the spread of the infection [5]. This is an effective way to reduce the rate of infection. Contact with fewer people reduces the risk of infection and makes the spread of the coronavirus less likely [6]. Overall, more than 100 countries around the world have had either a full or partial lockdown by the end of March 2020, affecting billions of people [7]. And confining them to their homes [5]. It is estimated that nearly 4 billion people were in social isolation during the April 2020 epidemic [8].

Mboera defines the lockdown as a set of measures to reduce COVID-19 transmission, which is mandatorily enforced by the community and applied indiscriminately to the public [9]. This means that you do not leave the house, except to buy the necessary goods, reduce the number of trips outside the house, and ideally only a healthy family member leaves the house if necessary [10]. Although lockdown minimizes the physical damage of the virus, it may harm the well-being of communities [11]. In the present study, a healthy family is defined as a family in which there no members suffer from COVID-19.

The family is the fundamental unit of all societies [4]. Families are the closest and most powerful source of growth, development, and health for individuals throughout life [12]. Family members rely on each other to varying degrees for emotional, social, and economic support [13]. Family interaction patterns are dynamic and shaped by socio-cultural, economic, and political conditions [4]. Moreover, major traumatic events such as the COVID-19 pandemic can reinforce the positive and negative aspects of interpersonal relationships and lead to competing narratives of injury and reinforcement [14, 15]. The COVID-19 pandemic is a stressor that originates outside the family system, but given the novelty and uncertainty about the disease, it is perceived as a significant stressor for many parents and children [16]. Even families who have not been directly exposed to the virus, are likely to experience the indirect effects of COVID-19 [17]. As COVID-19 continued to spread, it became clear that the virus and its associated problems were not limited to biomedical issues [4], but also led to problems among spouses or other family members, family caregivers,

and community primary health care providers. There is such a complex interconnection among these individuals and groups that social distancing and virtual interactions are not effective or adequate [4]. Studies have been published on the increase in domestic violence against women, children, and the elderly and psychological distress during natural disasters and the COVID-19 pandemic [18-22]. There is little knowledge about the effect of the COVID-19 lockdown on the mental health status of families and individuals [23]. Additionally, the dimensions of the psychological experiences of healthy families who were under lockdown are unknown. Given that one of the applications of qualitative research is the discovery of the unknown when we have little information about the target phenomenon, therefore, researchers have used explanatory descriptive qualitative research to investigate the living conditions and experiences of individuals under closure and lockdown during the COVID-19 pandemic. Previous studies have shown that understanding the psychological and behavioral responses to emerging infectious diseases is critical to managing outbreaks [24, 25].

In the present study, a healthy family is defined as a family in which no member suffers from COVID-19. This study aimed to explain family members' individual psychological experiences of the COVID-19 lockdown.

Participants and Methods

This qualitative study was a part of a research project done from October 2020 to February 2021 on Public population living in Khorramabad, Iran. The purposive sampling method was used. Sampling began with volunteer participants and new participants were recruited through snowballing of the desired participants with sampling variety from different locations. The sample size reached 29 at data saturation (Table 1). The inclusion criteria were being members of the families with access to the internet and WhatsApp (2020) video chat, The exclusion criteria were having a family member affected member by COVID-19, having a medical history of depression or other psychiatric disorders, or having already been affected by the coronavirus disease or other serious challenges. We recruited healthy family members with different characteristics by purposive sampling since this promoted the rigor of the study.

Unstructured in-depth interviews were used to collect the data. An explanatory descriptive qualitative research [26] was used to evaluate the experiences of the participants under lockdown.

Table 1) Participants' characteristics

NO.	Family Role	Age (Year)	Education	Job	Family Size (number)	Type of Family
1	Mother	28	Illiterate	Housewife	3	Nuclear
2	Mother	31	M.Sc.	University lecturer	3	Nuclear
3	Father	34	B.Sc.	Military	3	Nuclear
4	Mother	40	M.A.	Employee	5	Nuclear
5	Mother	39	Ph.D.	Employee	2	Single-headed family
6	Mother	34	M.A.	Employee	4	Nuclear
7	Daughter	35	M.Sc.	Architect	5	Nuclear
8	Wife	24	M.A.	Chess teacher	2	Nuclear
9	Son	23	Student	University student	3	Nuclear
10	Mother	45	B.Sc.	High school Teacher	4	Nuclear
11	Mother	40	B.Sc.	Employee	4	Nuclear
12	Mother	51	Ph.D.	Employee	4	Nuclear
13	Mother	50	B.Sc.	Housewife/ unemployed	4	Nuclear
14	Father	36	B.Sc.	Employee	3	Nuclear
15	Son	27	B.Sc.	Self-employed	9	Extended
16	Father	52	B.Sc.	Farmer	4	Nuclear
17	Mother	28	M.Sc. student	Nurse	4	Nuclear
18	Daughter	31	M.A.	Teacher	6	Nuclear
19	Father	37	M.Sc. Student	Clergyman	4	Nuclear
20	Mother	32	M.A.	Employee	3	Nuclear
21	Mother	50	Diploma	Tailor	2	Nuclear
22	Pregnant Wife	29	B.Sc.	Saleswoman	2	Nuclear
23	Father	30	Diploma	Taxi driver	2	Nuclear
24	Mother	50	Illiterate	Housewife/ unemployed	5	Nuclear
25	Father	65	B.Sc.	Retired	8	Extended
26	Mother	45	Intermediate education	Housewife/ unemployed	7	Nuclear
27	Daughter	14	High school student	unemployed	4	Nuclear
28	Single woman	49	Ph.D.	University professor	1	Single
29	Father	45	Diploma	Employee	2	Nuclear

The participants' involvement in the study was voluntary and we informed them that they could withdraw from the study without any repercussions at any time. Anonymity and confidentiality of the data were ensured. the data did not have identifiers and were anonymously used in the final report. Only the main researchers had access to the data. Informed written consent was obtained from the participants. Additionally, participants were informed of the objectives and methods of the study, including the need to record the interviews as well as their rights, including the confidentiality of information, anonymity, and the unconditional right to withdraw from the study. Before the interviews, we sent the informed consent forms to the participants electronically. We interviewed them after they gave their consent. The interviews were conducted via WhatsApp video chat and lasted about 20 to 60 minutes and were conducted individually. A voice recorder was used to record the participants' voices. The primary research question in this study was: "What are your emotional experiences of staying home during the COVID-19 induced lockdown?" Probing questions were asked based on the previous statements of the participants in order to get as much in-depth information as possible i.e. What is your emotional experience of staying home during the COVID-19 lockdown? What is your idea about the negative psychological effects of COVID-19 lockdown in your opinion? What are the positive psychological effects of COVID-19 lockdown in your opinion? How has the COVID-19 lockdown affected you? The interview environment was calm and devoid of disruptive factors. The first

author conducted the interviews. With the permission of the participants, all interviews were recorded with a voice recorder and the second author transcribed the recorded interviews verbatim. The interviews were analyzed by the first author and the codes and the coding process were revised by the second author. After analyzing the last interview and extracting its codes accurately, the next interview was conducted. At the same time as conducting the interviews, the interviews were also analyzed. We also asked an expert in qualitative research and a psychologist to review the coding process. Data collection was conducted through unstructured in-depth interviews in a secluded and quiet environment and time at the convenience of the participants. The content analysis approach proposed by Graneheim & Lundman was used to analyze the data [27]. Various types of data can be analyzed by qualitative content analysis. However, in general, before analysis can start, the data need to be transcribed [28]. Accordingly, at the end of each interview, the participants' recorded statements were repeatedly listened to and their statements were transcribed verbatim. The researchers read each transcribed interview several times to understand the participants' psychological experiences and perceptions. Then, significant statements and other related statements were underlined to identify meaningful units. Then, each meaningful unit was reduced to a condensed meaningful unit and the initial codes emerged. The first author carefully studied the original codes and categorized them according to the similarity of their concepts as subcategories. During this inductive

process, similar subcategories were classified into main categories. This coding process and the emergence of the main categories were reviewed and discussed by a third experienced researcher. Finally, the obtained categories were considered as expressing the hidden content of the text. The extracted codes were referred to the participants and with their approval, the findings were validated (member check). We provided the participants' characteristics. The researchers have the required research skills and knowledge to conduct their roles. The researcher also referred the findings and extracted codes to an expert in qualitative research and the validity of the research findings was confirmed (peer check). The coding process and the emergence of the main categories were reviewed and discussed by researchers. The dependability of the findings was achieved by performing the data analysis process by more than one researcher. Researchers tried to put aside their personal experiences and preconceptions in their engagement with the evolving findings and with the data. Moreover, the researchers used the audit trail to establish the confirmability of the study by providing the details of data analysis and some of the decisions that led to the findings. Transferability was ensured by selecting a variety of samples with various demographic characteristics. The researchers tried to make reassurance that both the research conduct and the evaluation were credible and genuine not only in terms of the experiences of the participants but also concerning the wider social and political implications of the research.

Findings

The findings of this study included both positive and negative psychological aspects, each of which had some categories (Table 2).

Negative Psychological Aspects

This theme describes the family members' experiences of anxiety, a sense of isolation and intensification of loneliness, mood and energy changes, disruption of the sleep-wake patterns, feelings of helplessness, more frequent family disputes and arguments, and increased risk of problematic Internet use and addiction.

Anxiety

This category describes the family members' experiences with the fear of getting sick, the stress associated with leaving home, obsession with washing, and the stress of staying clean.

All participants experienced stress and fear of infection. This category is one of the key themes that all participants spoke of it. Some participants mentioned overcoming and managing this stress and fear. In particular, two participants in the early stages of the COVID-19 pandemic were pregnant and endured a great deal of stress.

"...We all stayed home and I felt scared, and now little by little it became serious and we observed it. Little by little, we overcame the fear and we began to follow the health protocols." P2

"The only bad thing that happened during the lockdown was the stress, mostly because of my worries for my baby and my father." P3

"Two months after I got pregnant, we found out that COVID-19 was prevalent. I was very scared. I had just gotten pregnant. I was scared. It was my first child and I was scared. I did not go out much, just for the ultrasound scan. I was afraid of catching the coronavirus disease." P2

The participants experienced obsessive-compulsive disorder caused by the stress of the COVID-19 disease. In some participants, the obsession with washing had become a disorder.

"During the lockdown, even though we were inside the house, I always disinfected the bathroom and the whole house regularly, and I had a feeling of stress and anxiety. I used to disinfect the clothes. If we went out, we would hang our clothes outside the house." P1

"When I breastfed my baby, I washed my hands three times before breastfeeding, and I was really scared." P2

One participant reported her son's excessive stress and morbid obsession.

"My son washes his hands regularly and when I ask him to quit this habit, he says a voice in my ear commands me to wash my hands." P21

A sense of isolation and intensification of loneliness

Participants experienced social isolation, which gave them a sense of loneliness and created or exacerbated feelings of depression.

"We traveled much less, we all observed health protocols, we disinfected the equipment a lot, we kept our distance at home and we sat at a distance from each other." P2

"My children say we wish to see someone other than ourselves." P10

The participants reported the feeling of loneliness was exacerbated during the lockdown for old people. They stated this phenomenon has two reasons; Firstly, decreased social relationships cause the exacerbation of loneliness among the elderly. Secondly, family members prefer not to visit older people because they think the older people are weak and may be infected by closer contact. "This lockdown has exacerbated worsened loneliness in the elderly." P28

Mood and Energy Changes

Hardship and Fatigue from Lockdown and Feelings of Boredom: The experience of having a hard time staying home and the resulting boredom was expressed by some family members.

"It was a difficult time. It is not very easy for people who go to work and have a particularly high work efficiency and work hard to be idle, and this causes

them to be moody and have a lot of time on their hands without anything to do. This causes boredom and moodiness." P18

Anger: Some participants stated anger as an experience during the COVID-19 lockdown. It can also have interrelationships with other COVID-19 induced issues such as losing one's job, decreased income, and lack of entertainment. "It is not tolerable for children and parents to be at home all the time. A person becomes nervous, upset, and sometimes even depressed, and this also hurts the foundation of a good family. Anyway, anger arises, there are conflicts, there are conflicts. In a family, this requires strong management". P: 11

Depression: Participants experienced depression due to limited recreation and staying at home. Depression can be an outcome of other issues caused by COVID-19 as mentioned above.

"We used to take our son out before the pandemic, but we could not take him anymore. I was depressed, I could not go out anymore. We could not go out to have fun. We have not gone to a place of entertainment at all for 8 months." P1

"It was a very bad experience and many families became depressed" P27

Feelings of Helplessness

Family members were also tired of the restrictions due to the COVID-19 pandemic and expressed a sense of helplessness. Participant 2, who is a university lecturer said:

"With the prolongation of the COVID-19 pandemic, another damage to the mental health of families is the creation of some kind of helplessness. Helplessness refers to situations in which a person becomes frustrated with lack of improvements in their affairs and lack of control over them, and succumbs to frustration and despair." P2

The fatigue caused by restrictions led some people to become careless and show disregard for wearing masks and observing social distancing.

"It is hard for me not to have any contact with society. Life has become soulless and un-motivating for me. Sometimes, I get so tired of the lockdown that I go to visit my friends without a mask." P28

Disruption of the Sleep-Wake Patterns

Participants complained of sleep disturbances during the lockdown, among other issues, such as stress and psychological conditions. This issue had a close relationship with impatience and the difficulty of bearing the lockdown.

"During the lockdown, my sleep-wake pattern has become disrupted." P28

More frequent family disputes and arguments

Some participants experienced an increase in marital discord during their stay at home due to the lockdown, which led to increased disagreements and arguments in some families due to fatigue from the lockdown and staying at home.

"Marital relationships have changed. Many unspoken things are being said now. Of course, well,

these are sometimes good and sometimes positive, but in most cases, it can be said to have a negative effect, unfortunately. And it has weakened relationships." P17

"Well, the boredom and moodiness caused by the closure affect all members of the family, which somehow reduces the warmth of the relationships in families." P18

However, some participants stated this experience differently, as they experienced some improvements in family relationships. Participant 9 put it as "a double-edged phenomenon".

"The effects of staying at home during lockdown were double-edged, and in some cases led to the provision, development, and rapprochement of family relationships, but in other cases it also led to disputes and arguments, according to reports published by the Welfare Organization, referrals for counseling have increased more than before COVID-19." P29

- Increased the Risk of Problematic Internet Use: From the participants' point of view, addiction to the Internet and virtual networks was one of the wrong ways of adapting to the lockdown that people used to fill their solitary times with. The participants mentioned that excessive use of the Internet for any purpose, including social networking, can increase the risk of problematic Internet use in children and even lead to addiction to the Internet and digital devices, such as tablets, smartphones, etc., in children.

"On the other hand, those who started using social networks were drawn in a lot more and became more immersed in the virtual world. These are some of the things that result from the lockdown." P5

The participants worried about the increase in internet use and observe prolonged internet use for online learning or other goals in their children, and predicted the risk of internet abuse or problematic Internet use will increase. Especially if they couldn't manage them clearly.

"As a mother, I cannot determine whether my son is learning virtually or whether he is busy with other things. I sometimes don't have enough time to control him" P 10

Positive Psychological Aspects

- Movement toward the Expansion of the Worldview: This category describes; understanding the reality of death, taking advantage of the short opportunity of life, developing a sense of helpfulness and cooperation, and understanding the beauties of life and the world)

The participants have had novel experiences during the COVID-19 pandemic and the related lockdown, experiences that had not had ever before. In other words, they nurtured a new awareness toward encompassing the environment and others. Study participants understood the reality of death from the

COVID-19 pandemic and the increased mortality among friends and relatives and came to believe that the short opportunity for life should be seized.

"The coronavirus pandemic made me realize that life is short and death is imminent." P28

Participants became more aware of the beauties of life, grateful for their health, satisfied with the lockdown, learned to try to enjoy their lives developed a sense of helpfulness and cooperation, felt the expansion of their worldviews and perfection, and better understood the meaning of life. The participants also understood that health is the real wealth and asset.

"One of the positive effects was that we did not appreciate health (before the pandemic), we did not know how good it is when we are healthy, how bad it feels when we are sick, we did not appreciate it, we should have been thankful, but unfortunately we were not." P12

- A Sense of Joy and Happiness: This category describes contentment, intimacy, and gratefulness for health. As mentioned above, some participants experienced feelings of satisfaction and increased intimacy in their family lives and felt happy with having more free time. Some of them were satisfied they had enough time to be together.

"But in the relationship between spouses, I think it was a good experience, we were closer to each other, we became more intimate, we are together much more, and this is one of the positive effects." P4

Table 2) Categories and subcategories of data analysis

Categories	Subcategories
Negative psychological aspects	
Anxiety	Fear of getting sick
	The stress of leaving home
	Obsession with washing and the stress of cleanliness
A sense of isolation and intensification of loneliness	
Mood and energy changes	Hardship and fatigue from lockdown, boredom
	Anger
	Depression
Disruption of the sleep-wake patterns	
feeling of helplessness	
More frequent family disputes and arguments	
Increasing the risk of the problematic Internet use	Excessive use of social networks
	Internet abuse in children
	High risk of addiction to the Internet and digital devices in children
Positive psychological aspects	
The expansion of the worldview	Understanding the reality of death
	Taking advantage of the short opportunity of a life
	Developing a sense of help and cooperation
	Understanding the beauties of life and the world
A sense of joy and happiness	Satisfaction and intimacy
	Gratefulness for health

Discussion

The goal of this study is to explain family members' individual psychological experiences of the COVID-19 lockdown.

The present study investigated some of the negative psychological aspects experienced by family members as a result of the COVID-19 pandemic, considering that the pandemic has caused many negative physical and mental health issues in humans [1].

One of these negative psychological aspects is anxiety, as the key theme which had been experienced by all participants, including the subcategories of fear of getting sick, the stress of leaving home, the obsession with washing, and the stress of cleanliness. All participants experienced a variety of degrees of anxiety that could act as a trigger for other emerging conditions.

Other studies reported that the COVID-19 lockdown induced stress, anxiety, and depression in different populations [23, 29, 30].

Regarding the experience of high levels of stress during pregnancy in the present study, the findings of the Zhang & MA study also confirm that pregnant women experienced moderate to severe anxiety in the early stages of the COVID-19 pandemic [31]. It is obvious that every life-threatening event induces anxiety in the general public and also in families.

Although all family members were living in the family context, some of them reported feeling lonely and isolated. This depended on the degree of social interactions before the lockdown. Loneliness was a common experience for many people during the lockdown period, Loneliness can lead to the development or exacerbation of physical and mental illnesses [32].

Participants in the present study reported an exacerbation of loneliness among the elderly. Other studies confirm the main reason for loneliness was the reverse quarantine, in which older people were separated from the rest of their families to prevent infection [33]. This social isolation leads to chronic loneliness and boredom, which, if prolonged enough, can have devastating effects on physical and mental health. The negative effects of isolation are intensified in combination with widespread panic and anxiety [5]. As mentioned above, anxiety has a mutual relationship with lockdown-induced social isolation and they can have a synergistic effect on each other. Given the vulnerability of the elderly population, the concern of contracting the virus could intensify social isolation.

Participants mentioned being fed up with the lockdown, and feeling impatient and bored during the lockdown. There was not any relevant papers, but other studies reported lockdown is generally described as an unpleasant experience for those who are under it because it is accompanied by separation from loved ones, financial problems, insecurity, and impatience, among other consequences [34, 35]. Under these social constraints, individuals are forced to come to terms with the frightening fact of isolation that can contribute to interpersonal violence and boredom in the family.

Experiences of anger and depression were also reported by participants. Sigdel *et al.*'s study showed the prevalence of anxiety, depression, and depression-anxiety co-morbidity were high in the community during the COVID-19 pandemic lockdown in Nepal [23].

Some participants noted an increase in family disputes during the COVID-19 lockdown. Other studies confirm that more domestic disputes and violence have been reported during the lockdown [18, 19, 36], which may be due to economic pressures, unemployment, prolonged periods of staying home, anxiety, and so on.

The present study showed that the excessive use of social networks, search abuse, cyberspace abuse, the increased risk of the problematic use of the internet and digital devices such as tablets, smartphones, and personal computers by children are among the effects of lockdown and staying at home. The findings of a study by Dong show significant evidence of overuse of the Internet among Chinese children and adolescents during the pandemic. Internet use is mainly affected by the COVID-19 pandemic in a variety of ways, including the frequency and duration of recreational internet use and the rate of stay-up use [37]. Cauberghe *et al.* have also shown that teens use social media, as a primary source, to adapt and respond to feelings of loneliness and anxiety and as a method of adaptation to a lack of social communication during the lockdown [38]. The substitution of individuals' virtual communications for real communication and being under the pressure of social isolation and other psychological problems can predict Internet addiction.

Participants in the present study reported sleep and biological rhythm disturbances. Other studies confirmed that people experienced anxiety, paranoia, and sleep disorders during the COVID-19 pandemic as well as sudden and major changes in their daily routines [39, 40]. As mentioned above, living under COVID-19 induced lockdown could cause sleep disturbance.

Prolonged stress and other anxiety-arousing factors caused family members to feel tired and helpless during the lockdown. Findings from other studies confirm that repeated exposure to traumatic stress impairs a person's ability to maintain a consistent routine and creates feelings of threat, vulnerability, anxiety, confusion, uncertainty, and helplessness [22].

The theme of positive psychological aspects describes the expansion of the worldview and a sense of contentment and happiness.

The category of the expansion of the worldview includes the subcategories of understanding the reality of death, taking advantage of the short opportunity of life, developing a sense of helpfulness and cooperation, and understanding the beauties of life and the world which we called the nurturing of awareness toward encompassing the environment

and others. No study was found in this area. A study by Brown *et al.* showed that the participants could be mentally well-equipped to cope with lockdown [41].

A sense of contentment and happiness was expressed by participants with expressions such as satisfaction, intimacy, and gratefulness for health. In the present study, people who were not financially anxious enjoyed being under lockdown, being together, and happy. In line with this including Hamermesh reported increased marital satisfaction because of spending more time with one's spouse during the lockdown [42]. The happier people are, the more likely they are to comply with the lockdown and stay home. The findings of the study confirm that past and present happiness predict compliance with the lockdown, and the greater the happiness, the stronger this relationship [2]. In contrast, Greyling showed that the lockdown has a negative effect on happiness [11]. In the present study, we also referred to lockdown induced negative psychological aspects, but the people who are empowered to cope with such a crisis can grow.

Although the use of an online interview could save our time but in the lockdown condition, we had to conduct the online interview via WhatsApp messenger because all participants had access to it. therefore, we were not able to obtain field notes. Moreover, Given that we conducted the interviews via WhatsApp video chat, one of the limitations of this study was the internet speed disruptions. In case the connection was lost, after reconnecting, the question would be asked again to make sure that the interviewer and interviewee understood each other and can continue the interview.

Further studies are needed to investigate strategies for coping with COVID-19 induced anxiety. Family members should be empowered to take care of themselves and others. Family education is required to obtain authentic and appropriate information from valid resources. Community-based mental health interventions should be accessible to families at risk. Moreover, the financial support of vulnerable families would be really helpful.

Conclusion

The COVID-19 pandemic lockdown created negative and disruptive experiences and positive and constructive experiences for different individuals. Poor families experienced more emotional problems and symptoms. Because of the higher stress levels in these families, they experienced greater challenges within the family, and their compliance with the lockdown was reduced.

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