

Original Article:

Examining Family Cohesion during the Virtual Education of Students in the Course of the COVID-19 Pandemic

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Abstract

Introduction: The COVID-19 pandemic is linked to the development of virtual education for students at home and a shift in parental role. The family's cohesion and structure can be affected by a change in parental roles. This study was designed and implemented with the aim of investigating the effects of virtual education system designed for students on family cohesion during the COVID-19 pandemic.

Materials and Methods: A cross-sectional descriptive-analytical study was conducted with 374 parents of public school students in Khaf city in 2021. Samani's family cohesion questionnaire was utilized to collect the required data. The data were then analyzed through SPSS version 26, more specifically by using Tukey's one-way analysis of variance and post hoc statistical tests. The level of significance was set at $p < 0.05$.

Results: Mothers played the biggest role in the virtual education process of their children (69%). The majority of the participants (47.9%) were parents of elementary school students. The mean family cohesion score among the parents was 81.69 ± 23.66 , indicating a moderate level. There was a significant difference ($p < 0.05$) in the mean score of family cohesion among the studied parents based on the students' education stage, the parents' education levels, occupations, and monthly income.

Conclusion: The results showed that the virtual education of students in the corona pandemic has affected the cohesion of the family. The average level of family cohesion during virtual education is a source of danger for the foundation of the family. More attention should be paid to the issue of the family. The excellence and cohesion of the family requires accurate and practical programs in order to recognize the problems faced by the family during the virtual education of students.

Keywords: COVID-19, Family cohesion, Virtual education, Student.

1. Introduction

With its rapid spread, COVID-19 became a global pandemic and one of the most pressing health concerns in Iran and the

world. The new coronavirus had a substantial impact on the Iranian health system and society. In addition to the health care system, this disease has affected the education system [1, 2]. As a result of the pandemic, the affected nations were compelled to alter their

current educational methods and take measures such as school closures around the globe. This affected over 1.6 billion students from elementary to advanced courses. Closing schools has high social, educational, and economic costs; the disruptions to society are palpable, yet their effects on disadvantaged families are more devastating [3, 4].

Due to COVID-19, the world's health care systems faced numerous challenges also affecting other fields such as education [5, 6]. As the global COVID-19 pandemic began, health protocols emphasized social distancing [7]. In order to prevent the spread of the coronavirus, face-to-face trainings in schools and universities were suspended in many nations, including those of ours [8, 9]. Diverse solutions were proposed so that students' education would not be interrupted during the period of social distancing and that the curriculum would continue according to the predetermined schedule. Education was provided via television and in collaboration with the Education Channel, with educational justice as a primary concern. Because of the variety of educational levels and courses, it was practically impossible to provide all courses through television channels, despite successful experiences gained in this respect. On the other hand, one of the most significant shortcomings of this type of education was the unidirectionality and lack of interaction between the teacher and the student until an application was developed for education on the social network platform called the Social Network of Students (Shad). Despite being far from the ideals of virtual education, the problems of this application were gradually addressed to the extent that Shad was able to garner the relative satisfaction of teachers and students [10].

High costs associated with virtual education, along with the decision to close schools, universities, and educational centers, have harmed the education and learning system and created potential and actual difficulties for families [11-13]. Findings indicate that COVID-19 has posed numerous challenges for society, healthcare providers, and educational systems and has also altered people's familial bonds [5, 14]. These difficulties can disrupt the acceptance and proper enactment of family roles [15, 16].

To slow down the spread of the COVID-19 virus, schools around the world were closed in early 2020, transferring children's scholastic activities to their homes and imposing a massive burden on parents and school-age children. Using data from a 21-day diary study conducted between March and April 2020 in Germany, Schmidt et al. examined whether (a)

distance learning and (b) parents' involvement therein were associated with negative parent-child interactions and affective well-being of parents and children, over and above the effect of daily stressors. Participants were 562 parents. They responded to the daily items with respect to the youngest child living in their household. On days when children were working on school tasks, parents reported more negative parent-child interactions as well as lower parental and child positive affect. They also reported higher child negative affect, but not higher parental negative affect. Moreover, the days when parents were more heavily involved in learning (i.e., when children worked less independently) were those with more negative parent-child interactions, lower parental and child positive affect, and higher parental and child negative affect. Negative parent-child interactions were linked to lower affective well-being of parents and children, and partially accounted for the relation among daily stressors and affective well-being. The study highlighted the need for measures to better support school-age children and their parents during distance learning [17].

Family is the primary unit and foundation of society. It should be the source of security, peace, and fulfillment of emotional needs for its members so that they would achieve the desired growth and prosperity. Less cohesion and harmony between family members increases the likelihood of emotional, marital, and codependency disorders [5, 18, 19]. Coronavirus and its associated complications disrupted social and familial relationships. During the coronavirus disease, interpersonal and familial discord, as well as psychological, social, and familial tensions, increased [20, 21].

In Zhang et al.'s (2020) cross-sectional study, four thousand nine hundred and seventy-eight (4978) adolescents from Jiangsu Province in China was surveyed between December 2019 and January 2020. Findings showed that family cohesion and school cohesion are protective factors of psychological distress, but only family cohesion plays a moderating effect on cyberbullying involvement and distress. Moreover, the positive correlations between cyberbullying involvement and psychological distress become non-significant when the interactions are included in regression models. Last but not least, female students and students in higher grades or those with worse academic performance have higher degrees of distress. Their study revealed that instead of school cohesion, family cohesion is more important to mitigate the psychological impact of cyberbullying involvement and eventually heal the trauma. The results of their study showed that in

order to reduce the psychological effects of students in virtual education, family cohesion should be prioritized [22].

Also, Wang et al. (2022) explored the influence of family (family cohesion) and personal (psychological suzhi) factors on middle school students' aggression. A total of 20,114 middle school students aged 12 to 18 years completed the Family Cohesion Questionnaire, the Psychological Suzhi Questionnaire, and the Chinese Version of the Buss and Perry Aggression Questionnaire. The results indicated that there were significant negative correlations among family cohesion, psychological suzhi, and overall aggression along with its components. Additionally, psychological suzhi significantly mediated the relationship between family cohesion and aggression and its sub-dimensions. These results highlighted the important roles of family cohesion and psychological suzhi in adolescents' behavioral development and provided potential strategies to reduce middle school students' aggression [23].

The wide spread of COVID-19 has posed challenges to educational systems, leading to a shift from traditional face-to-face education to virtual education. The formation of virtual education for students at home and in family environment has led to a change in roles of parents and other family members; this can have potential or actual effects on family cohesion and structure. No prior studies, to the best of our knowledge, have investigated the effect of the virtual education system of students during the COVID-19 pandemic on family cohesion. Hence, this research aimed to determine the impact of virtual education designed for students in Khaf on family cohesion during the COVID-19 pandemic, given that the process of virtual education of students can alter the role and increase the responsibilities of parents within the family.

2. Materials and Methods

The population for this descriptive-analytical cross-sectional study comprised all parents of public school students in Khaf city (elementary, middle, and high schools) in 2021. First, the total number of target students in the city was determined. Given that Khaf's total number of public school students was 13,500, the desired sample size with a 5% margin of error was calculated as $n = 374$. A convenience sampling method was used to select eligible parents.

Children in only one educational stage, access to

smartphones to receive the link to the electronic questionnaire, reading and writing literacy, parents with primary role and assistance in the virtual education process of the child, and consent to participate in the study were the inclusion criteria. Parents were excluded if they had a marital conflict, a history of divorce, and incomplete questionnaire completion.

A demographic form (age, gender, education, occupation, and monthly income) and Samani's family cohesion questionnaire were employed to collect data.

Family Cohesion Questionnaire: Samani (2002) developed this scale based on existing research on correlation and Olson's circumplex model (1999). This scale consists of 28 items used to evaluate eight factors, each measured by a specific number of items. Following is a brief explanation of each of these factors:

Cohesion with the mother (items 3, 5, 11, 15, 17, 21): This component addresses issues such as the amount of consultation with the mother in decision-making, the degree of mutual understanding between mother and child, and the amount of intimacy, closeness, and interaction with mother. Typically, in families with a high level of cohesion, there is a strong correlation between children and mothers.

Cohesion with the father (items 4, 6, 10, 16, 18, 22): This component addresses issues such as the frequency with which the father is consulted on various matters, the level of mutual understanding between father and child, and the degree of intimacy, closeness, and companionship with the father. This component and the preceding one are essential components of family cohesion. Furthermore, the correlation between children and fathers is extremely strong in families with high cohesion.

Interaction duration (items 8, 9, 13, 14): This component measures the amount of time family members spend together, whether in an intimate setting or outside home.

Location of interaction (items 12, 27, 28): This factor examines whether the majority of interactions between family members occur within the family or outside home with other people.

Emotional relationships (items 19 and 20): This component examines the level of common interests, activities, and friends between family members, the loyalty of family members, closeness or emotional distance between family members, and the sense of belonging to and responsibility for the family.

Decision-making (items 7, 23, 25): This component addresses issues such as the extent to which family members assist one another in completing tasks and the extent to which they consult one another on major decisions. In families with high cohesion, collective decisions are preferred, and all family members' desires are considered. In contrast, individual decisions are more prevalent in families with low cohesion, and consultation with other family members is less frequent.

Marital relations (items 24 and 26): This component examines the type of relationships between parents and their level of intimacy, interest, and mutual understanding. In cohesive families, the degree of parental intimacy and mutual understanding is favorable, and effective parental communication serves as the foundation for children's moral and social development. In contrast, there are weaker intimate relationships between parents in families with low cohesion, and the tension and conflicts between them negatively affect children's emotional and social development.

Parent-child relations (items 1 and 2): In this subsection, issues such as the degree to which parents are strict with their children, the degree of the generational difference between parents and children, and the degree of their closeness and intimacy are examined. In cohesive families, there are clear boundaries between generations; the level of strictness towards children is balanced, and parents cater to the material, emotional, and social needs of children in an appropriate and balanced manner. However, in families with low cohesion, the boundaries are unclear; the level of strictness toward children is excessive. The rules and regulations are stringent, and parents are oblivious to their children's material and emotional needs due to their many problems and difficulties [24].

This scale consists of 28 items whose options are organized on a Likert scale and scored from 1 to 5 (1 = strongly disagree and 5 = strongly agree). There could be a maximum score of 140 and a minimum score of 28. In addition, in this study, 50% of the scores (higher than 96) were classified as high cohesion level, whereas the remaining 50% (less than 96) were classified as low cohesion level. Razavieh and Samani's (2000) research on this scale based on eight factors (cohesion with father, mother, duration of interaction, location, decision-making, emotional connection, marital relations, and parent-child relationship) demonstrates the adequacy of this scale for assessing an individual's relationship with their parents [24].

Numerous studies in this field have evaluated and confirmed the validity of this questionnaire. Jamshidi et al. (2008) reported that the test-retest and Cronbach's alpha reliability coefficients for this scale were 0.90 and 0.79, respectively [24]. The alpha coefficient and reliability of the entire scale are 0.90 and 0.78, respectively (Samani, 2008). In an additional study by Samani, the internal consistency coefficient of the scale was 0.85. Cronbach's alpha coefficient was 0.79, and the reliability coefficient using the test-retest method was 0.80 [25].

Since Samani's Family Cohesion Questionnaire has not been used to determine the relationship between family cohesion and virtual education of students, the content validity method was utilized to determine the validity of the researcher-made questionnaire. To this end, the questionnaire was distributed to 10 faculty members relevant to the study's topic, and the data collection instrument was validated using their suggestions and feedback. The CVI and CVR indices had values greater than 0.79 and 0.58, respectively. The questionnaire's reliability was determined using the internal consistency (Cronbach's alpha coefficient) and the test-retest methods. The questionnaire was piloted on a small sample of parents ($n=20$). After ten days, the questionnaire was administered to the same 20 parents in order to calculate the internal correlation coefficient. Cronbach's alpha coefficient for the questionnaire was $\alpha=0.77$, which is statistically acceptable and valid.

In order to collect data, the link to the electronic questionnaire was posted in popular city-level groups and channels, as well as the Shad application for students (upon coordination with the education department of the city). Teachers teaching through the Shad application were requested to encourage parents to complete the questionnaires. In this respect, teachers were asked (in accordance with prior coordination with the city's education department) to share with parents the link to the electronic questionnaire in the Shad application.

Data were analyzed using SPSS version 26 statistical software, more specifically through Tukey's one-way analysis of variance and post hoc statistical tests. The significance level was set at $p<0.05$.

Data collection was conducted after obtaining the university's code of ethics to comply with ethical considerations. There were no requirements to write out names and surnames. The information of all participants was kept confidential; the results were reported in a general manner and only according to the

research objectives.

3. Results

This study examined 374 parents, of public school students in the city of Khaf (260 mothers and 114 fathers), who played the primary role and provided the most assistance in the virtual education of their children. Most study participants were parents of elementary school children (47.9%). The highest frequency was associated with those aged 35 or younger (35.3%), those with a university degree (36.9%), housewives (49.5%), and those with a monthly income between 10-15 million tomans (42%) (Table 1).

Based on the results, the average score for family cohesion in the entire family was 81.69 ± 23.66 , which indicates a moderate level. Considering that the skewness and kurtosis coefficients for all research variables fell within the interval $[-2, 2]$, the

research data had a normal distribution (Table 2).

The results indicated that the mean family cohesion score of the studied parents did not differ significantly by age ($p=0.29$). However, there was a significant difference according to occupation, monthly income, and the students' levels of education ($p<0.05$). In fact, the average level of family cohesion among parents with children in elementary school was significantly lower than that of other parents. Similarly, it was lower among parents of middle schoolers than among parents of high schoolers ($p<0.001$). The mean family cohesion score was significantly lower for parents with primary education than for those with secondary and tertiary degrees, for self-employed parents than homemakers and employees, and for those with a monthly income of 10 million or less than for those with a monthly income of more than 15 million tomans ($p<0.05$) (Table 3).

Table 1. Demographic characteristics of the study participants

Variable	Frequency	Percentage
Student's education stage	Primary	47
	Middle School	31.3
	High School	20.9
Age (year)	≤ 35	35.3%
	36-40	19.3
	41-45	30.5
	> 45	15
Education	Primary	27.8
	Secondary	35.3
	Tertiary	36.9
Occupation	Homemaker	49.5
	Employee	34.5
	Self-employed	13.6
	Retiree	2.4
Monthly income (million tomans)	≤ 10	35.6
	10-15	42
	> 15	22.5

Table 2. The mean score of family cohesion and its components during students' virtual education in the course of the COVID-19 pandemic

Factors	Mean	Standard deviation	Skewness	Kurtosis
Cohesion with the mother	18.13	5.85	-0.27	-1.10
Cohesion with the father	17.57	4.89	-0.17	-0.57
Interaction duration	11.29	4.34	-0/05	-1.24
Location of interaction	9.04	2.77	-0.42	-0.69
Emotional relationships	5.67	2.01	-0/05	-0.79
Decision-making	8.26	3.17	-0.24	-1.11
Marital relations	6.09	2.13	-0.15	-0.91
Parent-child relations	5.63	2.38	0.40	-0.85
Family cohesion as a whole	81.69	23.66	-0.42	-1.12

Table 3. Comparison of the mean score of family cohesion in the parents according to demographic characteristics

Variable	Family cohesion		P-value for ANOVA test
		Mean \pm SD	
Student's education stage	Primary	72.21 \pm 85.55	<0.001
	Middle School	83.23 \pm 54.94	
	High School	99.16 \pm 21.67	
Age (year)	≤ 35	84.20 \pm 51.85	0.29
	36-40	81.25 \pm 65.99	
	41-45	78.25 \pm 65.28	
	> 45	20.23 \pm 30.20	
Education	Primary	73.24 \pm 9.71	<0.001
	Secondary	86.21 \pm 9.96	
	Tertiary	83.22 \pm 97.90	
Occupation	Homemaker	86.20 \pm 42.38	<0.001
	Employee	84.22 \pm 16.35	
	Self-employed	60.26 \pm 82.22	
	Retiree	67.25 \pm 56.63	
Monthly income (million tomans)	≤ 10	77.24 \pm 35.39	0.02
	10-15	82.21 \pm 83.98	
	> 15	86.24 \pm 45.62	

4. Discussion

Family cohesion is the feeling of unity, connection, and emotional commitment among family members and is defined as emotional closeness with one another in a family [24].

The COVID-19 pandemic was accompanied by the formation of virtual education for students at homes and in family environments, which ultimately led to a change in the roles of parents and other family members. The changes in parents' roles in the virtual education of students had direct and indirect effects on family cohesion and increased the responsibilities of parents in families.

The purpose of this study was aimed at investigating the effects of the virtual education system designed for students on family cohesion during the COVID-19 pandemic. One of the strengths of the current research is the absence of a similar study and the focus on one of the most significant challenges of the COVID-19 pandemic, namely family cohesion and its relationship with virtual education of students.

According to the findings of present study, the mean family cohesion score of the parents examined is at a moderate level. In the explanation of this research finding, it can be stated that the pandemic of COVID-19 altered the global education system by removing the traditional and face-to-face mode of education and replacing it with virtual education. The virtualization of education led to the transformation of students'

homes into classrooms; as a result, families were also involved in this process, resulting in altered parental roles and increased responsibilities. Therefore, based on what has been stated, family cohesion during the COVID-19 pandemic has been impacted by the virtualization of students' educational systems, role shifts, and increased parental responsibilities.

In explaining this research finding, it is possible to mention the financial problems of families in providing smartphones for students' virtual education, the inability to buy the Internet, and the illiteracy of parents. These are among the factors that directly influenced the educational status and learning of students; they indirectly affected family cohesion during the covid-19 pandemic [26, 27].

The findings of the 2013 study by Zarean et al. are consistent with this finding. They examined family health from a sociological perspective, observing that the level of family cohesion, along with other investigated factors, is at a moderate level [28]. Likewise, according to Sevinç and Garip's study (2015), virtual education at home leads various changes in the functioning of the family, and sudden changes in the family result in a decline in family cohesion [29].

Xu et al. (2020) discovered that the COVID-19 pandemic has negatively affected people's lifestyles. Particularly, changes in working conditions in absentia and the performance of work activities at home have caused stress and tension in the family environment,

resulting in problems in the relationships among family members [30].

In a similar vein, the findings of Zeng et al. (2021) indicate that the COVID-19 pandemic has been accompanied by fundamental changes in working conditions, education, and family member relationships and that these changes have lowered the levels of several family cohesion dimensions [31].

In their study, Zaeimzadeh et al. (2021) reached the same conclusion as the current study. They examined the relationship between teachers' conceptions of life meaning and family cohesion during the COVID-19 period. According to the findings of their study, family cohesion is one of the crucial factors in the COVID-19 pandemic, and plans should be made to strengthen it [32].

The present study revealed that the mean family cohesion scores of parents of elementary school students was significantly lower than those of other parents, as well as parents of middle school students than those of high school students. Due to the absence of a comparable study, it is not possible to compare the results of this research with those of other studies. In explaining this research finding, nonetheless, it can be stated that the low level of education and young age of the students will increase their reliance on their parents for education. Students with lower educational levels require more parental support and assistance to learn in the virtual education environment. Additionally, parents are more concerned about the use of smartphones by students with lower levels of education. Consequently, greater involvement of parents in the virtual education of students with lower educational levels may result in further erosion of family cohesion. According to findings the current study, virtual education has resulted in a greater decrease in family cohesion among families with children at lower educational stages than among those with children at higher educational stages.

The present study revealed that the average family cohesion scores of parents with a primary education were significantly lower than those of parents with a high school diploma or a tertiary degree. This result cannot be compared to similar findings due to the lack of a similar study. This finding can be explained by noting that the efficiency of virtual education for students is correlated with the literacy level of parents and that parents with a higher literacy level will be more effective in assisting their children in virtual education. Consequently, the number of challenges between parents and children, the number of

challenges between parents, and the educational problems of children in virtual education are significantly higher in families where the parents hold a lower level of education than in families in which parents have higher-level degrees; this results in a further decline in family cohesion among parents with a lower level of education.

The mean family cohesion score of self-employed parents was significantly lower than that of stay-at-home parents and employees, according to the present study's findings. Due to the absence of a similar study, it is not possible to compare the results of this research to those of other studies. However, this research finding can be explained by noting that self-employed parents spend the bulk of their time working and have fewer opportunities to assist their children with virtual education. Under these circumstances, conflicts between parents and children rise, which may be one of the reasons why self-employed parents have lower family cohesion than employed parents.

Lastly, the mean family cohesion score was significantly greater in families with a higher monthly income, according. The family's financial ability to provide educational aids and equipment, as well as the use of private tutors during virtual education to assist children in gaining high academic achievement, reduces the parental role in their children's virtual education. Less intellectual and physical involvement of parents with higher income levels in their children's virtual education may be one of the factors that has led to fewer conflicts between parents and children in virtual education; according to the findings of this study, this has resulted in greater family cohesion in families with higher monthly income.

5. Conclusion

Due to the immediate need for the learning and teaching process following the global spread of the novel coronavirus pandemic, face-to-face education mode was replaced with face-to-screen (virtual) mode. Despite its many advantages, this method of education can cause irreparable harm to the family and the students' physical, psychological, social, moral, educational, and behavioral conditions.

As found in the present study, family cohesion during the virtual education of students is at a moderate level. The average level of family cohesion during the COVID-19 pandemic is a health warning sign for families, which calls for increased focus on the family issue. The excellence and growth of the family necessitate that significant steps be taken in both the private and public sectors and that practical and

accurate programs be designed and implemented in accordance with the challenges faced by families during the virtual education of students.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed of the purpose of the research and its implementation stages. They were also assured about the confidentiality of their information and were free to leave the study whenever they wished, and if desired, the research results would be available to them. A written consent has been obtained from the subjects. principles of the Helsinki Convention was also observed. This study was approved by the Ethics Committee of the University of Mashhad (Code: IR.MUMS.MEDICAL.REC.1400.756).

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Author's contributions

All authors participated in the conception and execution of the project, as well as the initial drafting of the article and its revision, and they all accept responsibility for the accuracy and correctness of the present article's contents.

Conflict of interest

The authors declare that there is no conflict of interest in the present study.

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