



Explaining Adolescents' Experiences of the Impact of COVID-19 Pandemic on Lifestyle Behaviors

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ABSTRACT

Aims Since 2019, COVID-19 has become a public health emergency and a global threat. Although adolescents are a vulnerable group, they have not received much attention. Accordingly, the present study aimed to explain adolescents' experiences of the effect of the COVID-19 pandemic on lifestyle behaviors.

Participant & Methods This study was conducted as a qualitative study with a qualitative content analysis approach at Zanjan University of Medical Sciences in 1400. Purposeful sampling consisted of 21 adolescents of both sexes. The data collection method was semi-structured and in-depth interviews.

Findings A total of 112 initial codes were obtained, which after merging similar codes finally extracted 89 semantic units in 12 subcategories and 3 main categories including Physical consequences, Psychological consequences, and Cognitive-emotional consequences from the perspective of adolescents.

Conclusion Considering the formation of lifestyle behaviors in adolescence and the positive and negative effects of coronary heart disease on various aspects of adolescent lifestyle, it seems that governments should pay special attention to this age group that is the future makers of countries and steps Valuable for this age group to flourish.

Keywords Lifestyle; Adolescents; COVID-19; Qualitative Research

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Introduction

Coronavirus disease has become a global threat since 2019. To prevent the outbreak of coronavirus disease, staying at home serves as an effective strategy ^[1]. The considerable changes in lifestyle followed by the COVID-19 pandemic have influenced the health of different age groups potentially ^[2]. This pandemic, among other things, became a considerable challenge for children and adolescents because they had to make instant and extensive changes in their lifestyle, adjusting themselves to current situations ^[3].

According to conducted studies, the COVID-19 Pandemic puts adolescents at risk of many physical, mental, and social stressors ^[4]. Adolescents have experienced many stresses, including school closures, attending virtual classrooms, home quarantine, fear of infection, conflicts with parents, isolation, doing daily tasks at home, low social relationships, and big lifestyle changes. The mentioned stressors put adolescents at risk of a high rate of anxiety, depression, and other mental disorders ^[5, 6].

The long school closures and staying-at-home have affected the lifestyle behaviors of children and adolescents, reducing physical activities and increasing their immobility ^[1]. Consequences of such a lifestyle include disordered rhythm and quality of sleep ^[7]. On the other hand, mental problems caused by the COVID-19 pandemic and increased calorie intake co-occur with reduced physical activities during this period leading to obesity and weight gain ^[8]. Other negative impacts of quarantine on adolescents include expanded time spent on social media and internet websites ^[4], which, in turn, may cause physical and mental complications among adolescents.

The Adolescent period is full of rapid physical, social, cognitive, and emotional changes, adolescents' health is threatened by some factors, such as access to unhealthy products, unemployment crisis among young people, instability of families, environmental issues, war, and immigration. Moreover, the COVID-19 pandemic has led to many issues by changing the lifestyle. Hence, this age group must receive great attention since these changes during adolescence can affect health during other life periods ^[9].

Some studies have been done on the physical and mental effects of the COVID-19 pandemic in different age groups, while adolescents have been ignored although they are highly vulnerable ^[5]. On the other hand, conducted studies in this age group have focused on physical or mental aspects that caused the COVID-19 pandemic ^[4, 10].

However, there was not any in-depth study on the impact of the COVID-19 pandemic on all aspects of Iranian adolescents' lives. Therefore, the authors of this study decided to carry out a qualitative study to

explain adolescents' experiences of the impact of the COVID-19 pandemic on lifestyle behaviors.

Participant and Methods

The extant research was a qualitative study with qualitative content analysis conducted at Zanjan University of Medical Sciences, in 2021. The content analysis method tends to understand lived experiences of individuals and phenomena as they occur in natural situations ^[11]. The studied population comprised adolescents living in Abhar and Zanjan. Purposive sampling was done to obtain the most information from participants. Inclusion criteria were being in the age range of 10-19 and informed satisfaction, while the exclusion criterion was an unwillingness to continue the interview. The sampling process continued until data saturation, and 21 participants were chosen. Data were collected through semi-structured and in-depth interviews. After the research permission letter was obtained, the participants were invited to take part in the interview at the time and place chosen by them. The online interviews were done as voice messages via Cyberspace. Before the interviews got started, the researcher explained about voluntary participation ensuring participants about leaving study whenever they wanted, and information confidentiality. Finally, once participants signed the consent letters, interviews began. One question was asked to start the interview then the subsequent questions were designed based on the responses given by the participant. Questions were asked about the general impact of COVID-19 on lifestyle, nutrition, sleep, movement, social activities, etc., and probing questions (e.g., please explain your experience clearly) were asked if required. The interview took 40-60 minutes regarding the free time and patience of the participants. Interviews were recorded and transcribed. Data coding and analysis were done with the initiation of the first interview simultaneously. The process helped the researcher to lead the study better. In content analysis, qualitative content analysis was employed. In this method, a systematic categorization process was used to extract codes and categories from raw materials directly and inductively ^[12]. Accordingly, codes were extracted based on the meaning units adopted from participants, and descriptions, and then the codes were categorized based on the difference and similarities using constant comparison. Peer Check and Member Check techniques were used to approve Rigor, Trustworthiness, and Credibility. Results of data analysis and categorization were confirmed by several professors. Moreover, the comments of experts in qualitative research were considered in the design of the present paper. For member checks, the analyzed results were given to scholars to confirm the results. In terms of Transferability, all

steps were described in detail. In the case of Dependability and Confirmability, an external moderator experienced in qualitative research was employed who examined and confirmed the research process.

Findings

Participants comprised 21 adolescents in the age range of 10-19 years (Table 1). Overall, 112 codes were extracted, and then after similar codes were integrated, 89 semantic units were classified into 12 subcategories and 3 categories, including the effects of COVID on physical, mental, and cognitive-behavioral aspects of lifestyle behaviors from the viewpoint of adolescents (Table 2).

Table 1) Demographic characteristics of participants (N=21)

Characteristics	Number
Age (Year)	12-15
	16-18
	19-20
Gender	Female
	Male
Education level	Seventh-ninth grade
	Tenth-twelfth grade
	University student
Education level of father	Illiterate
	Elementary-diploma
	BA and above
Education level of mother	Illiterate
	Elementary-diploma
	BA and above
Number of siblings	<4
Income level	<5,000.000Rls
	>5,000.000Rls

Table 2) Define categories and subcategories and adolescents' experiences of COVID-19 consequences

Categories	Adolescents' experiences
Physical	
Nutritional behaviors	Adolescent 8; "I am a big fan of food, but I eat a lot of junky stuff (snacks, chips, chocolates, etc.) because I have free time. I get bored and watch TV for long hours, so I love to eat snacks when watching TV."
Sleep quality	Adolescent 20, "I ate a lot and gained weight." Adolescent 8, "I sleep during days because I go to bed late at night. I wake up early morning, so I become tired and sleepy." Adolescent 17, "Because we study online, I have to sleep at noon for my eye relaxation."
Physical activity	Adolescent 1, "We have less mobility and movement, so we try to get exercise at home." Adolescent 4, "Some of my friends of mine do not do the exercises that our teacher learns, our teacher does not know what students do or what they do not do but if we were in school we could do exercises with our coaches and it could have positive effects."
Physical complications	Adolescent 5 stated, "We had online teaching, and so we had to sit down the whole time and study our lessons." Adolescent 4, "We excessively use Cyberspace. I suffered from dry eyes and neck pain, so I was not able to move my neck to left and right for a while."
Psychological	
Psychological reactions	Adolescent 8, "I was so scared of coronavirus before, I was afraid of being infected but now I am better and more relaxed because my sister got infected and recovered from the disease." and "When if feel depressed, my family talk to me and make me feel better." Adolescent 2, "In the first days of quarantine, I was stressed out to stay home; it was hard for me and got bad-tempered or struggled with my sisters but now I feel better and relaxed and we do not quarrel with each other."
Social activities	Adolescent 4, "I am afraid of problematic future. If one wants to study mathematics, he or she has to study more and get ready for the entrance exam to the university. Now, those who are in 10 th or 11 th grade must study studiously; otherwise, they cannot go to university and get the jobs they want to have in the future." Adolescent 1, "Our social connections have become less." Adolescent 2, "we traveled to the county to visit my grandmother and also we had a journey to the north, although we have a house there and so we did not go out during our journey." Adolescent 8, "We attended a funeral because of the death of my father's relative."
Spirituality	Adolescent 1, "We cannot say that God protects us so we can do not follow sanitary rules; we must observe rules and ask God to help us." Adolescent 3, "This pandemic influenced me a lot, I have not been involved in prayer much before but now try to pray regularly." Adolescent 1, "I pray not me and not my families get infected, but death is destiny."
free time	Adolescent 6, "I make Dubs mash and work on music." "Adolescent 7, "I learn cooking from my mother." Adolescent 21, "We go to our garden, and I help my father there." Adolescent 20, "This pandemic made me aware of the importance of art, one should know at least an art."
Challenges of Cyberspace	Adolescent 12, "I spent my time surfing through my cellphone and use Instagram because I have no other task." Adolescent 17, "Currently, many online businesses have been set due to corona, so I made a page to make money and fill my free time."
Cognitive-emotional	
Awareness and knowledge	Adolescent 7, "I believed that if we follow sanitary protocols, we remain safe." Adolescent 3, "Every time I go out, I try to wear a mask and observe social distance".
Commitment and responsibility	Adolescent 4, "If we go out, indeed we are putting the life of nurses and doctors at risk." Adolescent 8, "During the pandemic, I thought more about myself and my life to find a better way to live."
Purposefulness	Adolescent 9, "I now organize and plan my tasks accurately allocating an hour to exercise and an hour to study trying to study like past."

Physical consequences: Adolescent lifestyles have undergone major changes as a result of the COVID-19 epidemic. One of the lifestyle changes has been in the physical dimension, which can be studied in four subcategories of Nutritional behaviors, sleep quality, physical activity, and physical complications.

Nutritional behaviors: The direct effect of nutrition on human health has long been known. By using the necessary and sufficient food, efficiency, and activity, satisfaction, the vitality of life, and the power to fight problems in human beings are provided, and at the same time, the health of the next generations is guaranteed.

Sleep quality: Sleep quality is an important clinical construct. The quality and quantity of sleep affect learning, memory, and a large number of cognitive abilities, especially actions related to the storage of new information and skills in educational settings.

Physical activity: Physical activity caused by the muscles and skeleton of the body increases energy consumption. Physical activity is one of the most important factors affecting physical health and quality of life.

Physical complications: COVID-19 pandemic and its resulting quarantine have caused sedentary lifestyles and changes in daily activities among adolescents. A sedentary lifestyle and the tendency to use mobile and cyberspace during this period lead to many physical complications.

Psychological consequences: One of the changes in adolescent lifestyles during the COVID-19 epidemic has been changes in the psychological dimension. Which can be studied in five subcategories of psychological reactions, social activities, spirituality, free time, and challenges of cyberspace.

Psychological reactions: Psychological damage to people is like a huge iceberg, most of which is underwater and invisible. Disability and psychological consequences Things like the COVID epidemic, which sometimes lasts a lifetime, form the main body of this iceberg and are often overlooked. Although these psychological wounds are hidden, they cause suffering and disability to many people. For this reason, it is necessary to address psychological reactions to normalize reactions and prevent complications that lead to a decline in the quality of individual and social life and reduce the efficiency of individuals.

Social activities: A human is a social creature. It is important to have a role in society and life to feel more successful and useful, to strengthen self-esteem and confidence, to develop emotional and social spirituality, not to feel lonely and helpless, and to be able to deal with problems and problems in the best possible way to solve. As a result, social activity is necessary to maintain the health of the body at any age.

Spirituality: Spirituality covers a wide range from the highest human affairs to the search for the

ontological meaning or transcendent dimension of human existence.

Free time: free time is an opportunity in which a responsible person is not responsible for any task or task. He has the time to do something with personal desire and motivation. In fact, the most obvious feature of leisure is that man chooses one from a wide and varied set of activities at his discretion based on inner satisfaction and personal motivation.

Challenges of Cyberspace: Cyberspace is an environment in which the communication, viewing, and transmission of information in structures and formats as services to humans is designed and controlled. Cyberspace is a continuation of real-life and sometimes even the starting point of many interactions and events in our tangible world.

Cognitive-emotional consequences: The emotional-cognitive dimension of adolescent lifestyle was also affected by the COVID 19 epidemic, which is addressed in three subcategories.

Awareness and knowledge: Awareness is a very deep concept that has nothing to do with science and knowledge and all kinds of mental reserves. Each of us may have a lot of knowledge and information about different and varied topics, but this does not mean that we are aware. So conceptual awareness is higher than knowledge.

Commitment and responsibility: The concept of responsibility is closely related to the concept of commitment. A responsible person is a person who makes informed decisions. Behaves correctly, logically, and calculated. In addition, the responsible person accepts the consequences of his actions and decisions and considers them.

Purposefulness: Purposefulness and purposeful thinking always seek to change the current situation to the desired situation with a careful and calculated analysis of the situation. Purposeful thinking leads individuals and businesses to overcome problems and obstacles one after the other and ensure their survival and success. What is reinforced in this way is creativity, by which the goals will be achieved as they should be.

Discussion

Like a pandemic, COVID-19 has harmed the lives of millions of people. The preventive measures taken to prevent disease outbreaks have left many impacts on different sectors and age groups. However, infected adolescents have been ignored, while many preventive solutions must be designed to prevent any unpredicted effects (e.g., increasing dropout, learning interruption, the severe gender gap in education, dependence, and addiction to technology) on physical, mental, and social health, as well as their future [13]. In the extant study, adolescents were asked to explain their experiences about the impacts of COVID-19 on all aspects of their lives,

including physical, mental, and cognitive-emotional aspects.

In the category of Physical consequences, subcategories of nutritional behaviors, Sleep habits, Physical activity, and physical complications were extracted. In the present study, adolescents stated that the COVID-19 quarantine period affected their nutritional behaviors. Ruiz-Roso *et al.* found the significant effect of COVID-19 confinement on dietary habits and indicators of adolescents aged 10 to 19 years. Gender, family members at home, watching TV during mealtime, country of residence, and maternal education were diversely correlated with adequate nutrition during COVID-19 confinement [14]. In the present paper, some adolescents pointed to some similar cases, including increasing consumption of junky foods, particularly when watching TV during quarantine. Sulistiani introduced optimal body defense, including a balanced nutritional diet as a necessity for COVID-19 prevention [15]. In the extant study, some adolescents also referred to healthy nutrition as a factor for increasing the immune system and COVID prevention. Understanding the adolescents' nutrition behavior during COVID-19 lockdown will help public health authorities reshape future policies on their nutritional recommendations, in preparation for future pandemics [14].

The adolescents' experiences showed that they had a disturbing rhythm and sleep pattern and complained of insomnia. Bruni *et al.* indicated that COVID-19 lockdown led to considerable changes in the sleep/wake schedule of all groups but not in adolescents [16]. Miri *et al.* also found increased sleep disorders during the COVID-19 pandemic among medical students of Hamedan University of Medical Sciences [17]. In the extant study, adolescents pointed to changes in sleep rhythm, including going to bed late, waking up late, and increasing naps.

The category of Psychological consequences was classified into subcategories of Psychological reactions Social activities, spirituality, free time, and Challenges of virtual space. Adolescents' experiences indicated psychological reactions such as stress and anxiety. Due to its high rate of death and pathogenesis, corona disease has led to worldwide fear and anxiety. In general, stressful factors during the COVID-19 pandemic include health anxiety, conspiracy theories, long time of quarantine, fear of disease spread, hopelessness, fatigue, lack of protective tools, insufficient information, financial loss, rumors, negative beliefs about vaccination, and infection stigma. Although many non-pharmaceutical policies made on the prevention of corona, including quarantine, social distancing, school closures, etc. have had positive effects on coronavirus outbreaks, the mentioned methods, in turn, have harmed life of children and adolescents [18-24]. According to conducted studies, the specific pandemic conditions may lead to mental health

disorders, anxiety, and depression symptoms among adolescents that may be worsened by poor social support and loneliness [25-27]. Based on relevant studies, when children and adolescents have to stay home, they most likely suffer from anxiety and depression [28]. The mentioned results were in line with the findings of the present paper.

Adolescents' experiences expressed the stress and anxiety of information bombardment by the media and cyberspace. Although the media are informing people about coronavirus outbreaks in the pandemic period, some wrong and non-scientific analyses may exist [29, 30]. According to conducted studies, excessive exposure to information worsens the pandemic situation, which may cause anxiety, depression, fatigue, and emotional exhaustion among people [31]. Death news and corona-related rumors would intensify anxiety, concern, and depression symptoms in society [32]. In terms of social media, Moradi *et al.* found that some of these social media increased social panic related to the corona disease pandemic [33]. The results of our study were in line with the mentioned studies. Coronavirus-caused infection and death of relatives are introduced as stress sources among adolescents in the present paper. Mallik & Radwan concluded that those who have lost their family members experienced more psychiatric disorders [24]. This finding was matched with the results of the present study.

Jansen *et al.* found that children and adolescents in vulnerable life situations would be victims of this global crisis [34]. Among adolescents, those who are making themselves ready for university entrance exams tolerate high pressure. In the pandemic era, the pressure has been intensified due to online education, interruptions in the natural studying process, and a reduction in interactions with teachers and peers [35]. In the extant study, those adolescents who were making themselves ready for the university entrance exam named this exam as the most important stress and anxiety stress during a pandemic; hence, these adolescents are more vulnerable to pandemic injuries rather than others. According to conducted studies, long studying hours that students spent doing their homework and less sleep time may put the mental health of adolescents at risk [36-38]. The aforementioned results were consistent with the findings of the present study. Therefore, it is recommended to take appropriate psychological interventions, especially telephone services and especially online to treat mental disorders during this period [23]. For instance, China state strives to provide interventional and preventive strategies by giving updated information through websites and social media. Psychologists and psychiatrists widely use social media to share some strategies that relieve mental stresses [30]. The aforementioned interventions are done to recover the primary services and security for the harmed

population, empower family and society networks, provide anxiously and harmed people with social support, and present specialized mental health interventions for pandemic survivors [23].

Adolescents' experiences indicated changes in their social activities.

During the COVID-19 epidemic, Countries advised people to stay at home to control pandemics. This advice does not mean similarly to all society members since they have different understandings of home. For those with limited social relationships, home means a physical place, while in a family-based country like Iran, home does not mean just a physical place, but it is a place for gathering in a safe place. The mentioned understanding leads to an increase in commutations instead of its reduction. Hence, a part of society has reduced their social relationships in external areas, so suffer from isolation due to social distancing policies, while another considerable part of society has made more relationships with relatives and parents [39]. In the extant study, adolescents pointed to higher intimacy between family members and more relationships with close relatives. This finding was in line with the results of the study in which, 79% of participants mentioned good opportunities to make a relationship with their families during a pandemic [40]. Improved positive and compatible relationships between adolescents and family members during the COVID-19 pandemic can play an effective role in solving conflicts between them that occur due to rapid biological, mental, and social changes during adolescence [41]. Badrkhani showed the important role of virtual space in quarantine and its effect on education and family conversations [42]. In the present research, some adolescents who observed lockdown rules explained that they made their communications with friends and relatives via social media or phone indicating the reduction in face-to-face relationships of adolescents to control the disease.

During the COVID-19 pandemic, many social ceremonies that can make empathy and compassion among society members remain suspended. For instance, funerals are not held, and no alternative mechanism is considered. The issue of unspoken grief is such a serious case that many countries tend to hold online mourning ceremonies, so some countries, like the UK, have provided some teachings and guidelines on a public website to cope with unspoken grief. In this case, people can use these instructions to relieve their pains [41]. In the extant study, participants stated that they participated in funerals of their relatives and this is an alarm for disease outbreak. It seems that health policymakers must pay attention to this case by considering alternatives for face-to-face funerals and creating this culture.

As a strategy for life-threatening situations and coping mechanisms that could make the mind

relaxed and improve life meaning and purposefulness, spirituality was also mentioned by adolescents. It seems that finding purpose in life and awareness of a relationship with God is necessary to cope with different diseases. Olonade *et al.* showed that rather than attributing coronavirus incidence to spirituality alone, most of the respondents also see it as a public health concern. Moreover, most believe that religious houses provide 'essential' emotional and spiritual support to the people. Respondents also believe they can get their healing from their place of worship even if infected with the coronavirus [43]. The findings of this study were consistent with the present study in which, adolescents pointed to their deeper and closer connection with God, as well as the role of spirituality in their mental comfort explaining that they found a suitable opportunity during quarantine to think of life concept that seems a chance for spirituality improvement in the life of this age group. However, adolescents who participated in the present research attributed corona disease to destiny, which was not in line with the findings of Olonade *et al.* [43].

The adolescents' experiences showed that they used different ways to spend their leisure time in quarantine. Researchers concluded that the highest and highest rank in the field of leisure time under quarantine to prevent coronavirus, respectively, entertainment, life activities, skills, exercise, physical activity, spiritual activities, study, and scientific activities [44]. Our study findings also confirmed the results of their study 19-COVID has led people to look for creative ways to stay healthy. Listening to or making music, cooking, singing, gardening, and even doing everyday tasks such as taking a shower or cleaning the house can give people creativity. In this study, adolescents expressed a need to learn a skill that could be useful in their free time.

In this study, adolescents pointed to the opportunities and threats of cyberspace. The results of a study showed that despite the numerous opportunities in cyberspace, due to the lack of proper and adequate education, the threats posed by cyberspace become more visible and effective and the need for comprehensive media literacy training and management of this space is felt more than ever [45]. Cyberspace requires management and the necessary training should be provided to adolescents even cyberspace can be used as an opportunity for training So that users can use this space for the benefit of themselves, their families, and ultimately their community.

Subcategories of awareness and knowledge, commitment and responsibility, and purposefulness were extracted for the category of cognitive-emotional consequences.

According to the teens, they had enough knowledge about COVID disease and ways to prevent it. Perceived knowledge, attitudes, and threats are

important predictors of health behaviors. The study by Bashirian *et al.* showed a direct and significant correlation between COVID-19 preventive behaviors and perceived severity and sensitivity [46]. Seemingly, efforts made by audio and video media and social networks to inform people about pandemic control methods, as well as governments' emphasis on sanitary protocols have increased awareness, particularly among adolescents. Adolescents noted their increased commitment and responsibility during this period. According to Schwartz, despite the negative effects of the epidemic and quarantine many teens can adapt to these situations. For example, take more responsibility for themselves Participate in individual and family recovery processes and engage in more social behaviors, for this reason, their capacity for recovery and resilience will increase [47] which is in line with the findings of the present study. In the extant study, adolescents pointed to increased confinements, health awareness, and health protocols. According to the obtained results, adolescents have made accurate plans for their lives and searched for more information about disease control during the pandemic. Because this disease has affected daily life, many attempts are dome to do daily routines again.

Conclusion

Because COVID-19 has influenced all aspects of adolescents' lifestyles both positively and negatively, the positive behaviors must be improved and stabilized; on the other hand, negative behaviors must be reduced using some solutions. In this case, we can help adolescents, who tend to shape the future, to encounter the disease and achieve self-fulfillment which is the perfection of every human being by choosing healthy lifestyle behaviors.

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