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The Effect of the COVID-19 Quarantine on Body Weight, Eating Habits and Overall Physical Health of Children and Adolescents

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ABSTRACT

Objective: The ongoing COVID-19 crisis has affected many people worldwide with restrictions in their daily lives. This pandemic has also affected eating behaviors and eating habits. The quarantine for the COVID-19 pandemic is affecting children, adolescents and lifestyle patterns globally. This study aims to investigate the effect of the COVID-19 quarantine on body weight, eating habits and overall physical health of children and adolescents.

Conclusion: Inactivity or lack of regular physical activity is the fourth most common risk factor for mortality worldwide, accounting for 6% of the world's mortality. The level of inactivity is rising in many countries, especially in high-income countries, which has major health implications for public health worldwide. The COVID-19 quarantine period showed increased smartphone use, less physical activity, uncontrolled food intake and weight gain. Physical activity is one of the main prerequisites for growth and health and the basis of a healthy and happy life, which plays a significant role in creating mental peace and possibly developing positive habits and attitudes in life. Scientific evidence shows that refraining from physical activity and exercise and not having a proper dietary culture causes the caloric balance of the body to be disturbed, resulting in losing the desired weight.

Keywords: COVID-19 quarantine; Body weight; Eating habits; General physical health; Children; Adolescents

INTRODUCTION

The novel 2019 Coronavirus (COVID-19), first reported in China in December 2019, has spread rapidly outside China and Asian countries. In March 2020, the world health organization declared it a pandemic. In this situation, many countries, with the emergence of their first cases and the announcement of quarantine strategies at the local and international levels, were forced to adopt strict public health measures to reduce the outbreak rate of the COVID-19 pandemic. This was followed by mandatory home quarantine for about 4 billion people, which had significant adverse health effects. Globally, the negative health impacts of COVID-19 have extended to social and economic impacts, with school programs for children and adolescents being abruptly interrupted. After the first case of COVID-19 was reported in Iran, the government closed schools, borders and airports, banned public gatherings and restricted the use of cars during certain hours of the day, except for health

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providers and primary care workers. Moreover, children and older adults were prohibited from leaving home [1-5].

Schools and universities continued through e-learning courses using the distance learning system through mobile phones and television [6-10]. During the Acute Respiratory Syndrome (SARS) epidemic, it has been reported that a high prevalence of psychological stress, low mood and irritability following quarantine was ass ociated with fatigue, emotional disturbance, anger, insomnia and depressive symptoms [11-15].

Lead people to consume high-sugar foods and choose high-calorie foods to boost their mood. Furthermore, the closures of schools and home quarantines due to the spread of COVID-19 have also affected the children and adolescents' physical and mental health and their quality of life. Decreased physical activity in children, the emergence of stressful stimuli at home such as fear of getting infected, unpleasant thoughts, the lack of communication with classmates and friends and the lack of adequate space for physical activity at home can have lasting effects on the mental health of children and adolescents. Also, staying at home for long periods of time may lead to eating more high-calorie foods and snacks and may also affect individual choices to "cook or buy ready-made meals," and may also lead to reduced physical activity [16-18].

In a study, investigated the relationship between the nutritional and health effects of the COVID-19 pandemic on diabetic patients. The results showed that patients in this period adhered more to the recommendations of health service providers and chose the right food products, which led to maintaining these people's health. Strengthened the argument that the COVID-19 pandemic exacerbated the weight gain factors associated with summer recess by preventing children from attending school. The authors hypothesized that households stock up on ultra-processed and calorie-dense foods during the closure [19-23].

Action plans for the quarantine of COVID-19 are closely related to obesogenic practices, especially low physical activity, increased food consumption and unhealthy eating habits. Conditions have been created where people sit for long periods of time, promoting sedentary behaviors, such as exposure to screens (computers, video games, tablets, televisions and smartphones), teleworking for those people who can do their work from home and the closing of cinemas, theaters, parks, recreational spaces, sports spaces and gyms [24-28].

Showed that maintaining regular physical activity during isolation is important to prevent weight gain. A recent study of the Australian population found that 43.4% exercised less during the COVID-19 pandemic, which was associated with overeating and exercise. In addition, perception of weight gain during quarantine has been observed in 48.6% of the Italian population. In a study, found that during the confinement period of COVID-19, body weight gain was positively associated with consumption of fried foods, low water intake and sedentary time ≥ 6 hours per day. On the other hand, fish consumption, active rest and physical activity ≥ 4 times a week showed an inverse relationship with body weight gain. Children and adolescents (youth) make up a significant share of the population (30%) [29-34].

Healthy eating patterns during this period could improve the level of well-being and the power in mental activities and prevent complications and problems such as iron deficiency, obesity, digestive disorder and tooth decay in the short term and chronic and dangerous diseases in the long term. Studies in our country have shown that 15.4% of children under five years old suffer from nutritional short stature and based on weight and age index, 10.9% of them are moderately and severely underweight. Also, children's eating habits will remain until adulthood and will be difficult to change at that stage. Therefore, investing in the proper nutrition of children and students is a cost-effective investment. The benefit of this vital investment is to increase production in various fields, create technical knowledge, eliminate dependence and have a healthy and dynamic generation. In addition, nutrition is an important factor in determining students' health and academic success. Research in this field has shown that students with malnutrition have less accuracy, concentration and significant academic decline.

Conducted a cross-sectional study in 2016 with 2702 subjects aged 6 to 17. The prevalence of overweight and obesity was reported as 17.3% and 15.7%, respectively. In 2016, the overall prevalence of malnutrition among overweight and obese children aged 10-17 in Oman was 46.1%. A systematic study conducted reported that the prevalence of overweight and obesity among boys and girls under 20 years old was 24.1% and 25.4%, respectively. In addition, in a school-based cross-sectional study with a sample size of 6447 adolescents aged 18-15 highlighted the prevalence of overweight and obesity among adolescents in 8 Arab countries. According to WHO reference standards, the rate of overweight and obesity among Jordanian adolescents was 11.8% and 10.6%, respectively [35-38].

Studied the effects of nutrition, lifestyle habits, physical activity and perceptions on Body Mass Index (BMI) in children aged 12 to 15 years: A cross-sectional study comparing boys and girls. This cross-sectional study was conducted on a high school sample group of 5144 subjects aged 12 to 15. The results showed that boys were 2.9 (95% CI: 2.592-3.328) times more likely to be overweight/obese than girls. Partial proportional ordinal models show a significant correlation between nutrition variables, physical habits and perceptions, but gender differences also play a significant role in socio-demographic factors, nutritional risk factors and physical activity habits and perceptions. A detailed understanding of the factors contributing to gender differences in nutrition, physical activity, habits and perception may guide interventional efforts. A study aimed at determining the relationship between physical activity and food intake on getting infected by COVID-19 showed that in inactive people, aerobic physical activity, with intensity and duration that causes fatigue, is likely to reduce the risk of contracting or the severity of COVID-19 disease in them. Also, following a

balanced diet and a regular intake of cereal, meat, protein and fruit food groups and possibly taking vitamin C and vitamin D supplements (especially in cases of not getting enough of them through food) is associated with an increase in the body's immunity against infection or a decrease in the severity of the COVID-19 disease [39-43].

In research, investigated the effect of an obesity prevention program on children's eating behaviors, food addiction, physical activity and obesity status. The obesity prevention program was implemented in the intervention group and the routine curriculum training program was followed in the control group. Study data were collected before and in the third, sixth and fifteenth months after the intervention. Data were analyzed using *chi-square*, McNimer, Cochrane's Q test, multivariate analysis of variance in repeated measures, Bonferroni adjusted paired t-test, power analysis, effect size and regression analysis. At the end of the study, it was found that the values of the body mass index and food addiction in the students of the intervention group were lower than those of the control group ($p<0.05$). Between the mean scores of intervention and control group students obtained from the eating behavior questionnaire and the physical activity questionnaire in terms of time, group and group interaction*, there was a significant difference in time ($p<0.05$). Also, the intervention program had a significant (0.39) and a strong effect (0.85) on body mass index. The results showed that the interventional program of obesity prevention was effective in increasing children's positive eating behaviors and physical activity mean score and reducing the amount of food addiction and body mass index values [44-47].

Thus, nutrition is one of the fundamental aspects of life and community health. People with high nutrition knowledge have much healthier eating behaviors because knowing about nutrition affects choosing healthy foods and diet behavior and plays an essential role in changing the diet behavior of individuals. Several studies on obesity have shown that continuous growth in obese individuals is directly related to reduce physical activity and intense nutrient intake due to developed industrial technologies [48-50].

As long as there are several widespread adverse health consequences, the prevalence of obesity may be recognized as an apparent public health concern worldwide. The relative importance of a sedentary lifestyle as a related factor cannot be denied. Therefore, paying attention to the development of motor abilities in order to train people in doing sports activities and life tasks is essential. Ages 5 to 16 are when food should be provided for rapid growth. Therefore, the importance of paying attention to nutrition in this period is doubled. One of the most important factors affecting the motor abilities of a person is the physical condition of the person, which is influenced by nutrition and physical activity. According to this information, the study aims to investigate the effect of home quarantine on body weight, eating habits and overall physical health of children and adolescents during the COVID-19 pandemic.

LITERATURE REVIEW

Coronavirus: The outbreak of the 2019 Coronavirus (COVID-19) began in Wuhan, Hubei Province, China. The 2019 Coronavirus spread rapidly across China and many other countries. The spread of this disease was so prominent that it is referred to as a global health concern, to the extent that the world health organization declared the 2019 Coronavirus as the sixth public health emergency [51-54].

The 2019 Coronavirus (COVID-19) is an acute respiratory infectious disease with a high human to human transmission rate. Also, common cold like symptoms such as cough and dry throat caused considerable anxiety about the 2019 Coronavirus disease in healthy, non-infected people. In other words, the 2019 Coronavirus disease has certain characteristics that lead to a series of distorted perceptions, interpretations and understandings in people and creates illness cognitions in them. In this regard, different countries adopted various measures and restrictions to prevent or stop the spread of the COVID-19 virus, including social distancing, home quarantine and telecommuting, which led to unprecedented changes in people's lifestyles; To the extent that many social, educational, family and economic interactions of countries have been brought under its radius.

Being in stressful and anxiety-provoking situations, including home quarantine, increases emotional eating in people. It usually also includes high-calorie and high-fat foods that increase the risk of eating disorders. On the other hand, limited access to some food products as a result of food hoarding and severe restrictions on sports gyms during the COVID-19 pandemic may be of concern to many people with eating disorders, especially those who previously restricted excessive food intake. In fact, it can be said that food insecurity and insufficient movement in many people lead to eating disorders and obesity [55-58].

Eating Habits of Children and Adolescents

Over the past few decades, obesity and overweight in adolescents have increased significantly worldwide. A third of the population worldwide can now be classified as obese or overweight and all indications point to further expansion in the coming years. Obesity is a complex condition influenced by genetic and environmental factors. Dietary intake is associated with obesity in terms of volume, composition, frequency of meals, snack habits and diet quality. Furthermore, there are indications that children are likely to maintain their eating habits into adulthood. Therefore, understanding children's eating habits are essential in terms of children's health.

Eating Habits in Children

Eating habits continue from childhood to adulthood, so understanding children's eating habits is essential in terms of children's health. Nutrition is the primary interaction factor between parents and children, especially in the first year of life, which begins with breastfeeding. Towards the end of the

first year of life, children begin to learn to feed themselves and switch to the family diet and eating pattern. A review that assessed national and international research articles on children's nutrition and eating behaviors concluded that when children turn to the family diet, the parents' recommendations refer not only to the food but also to the context of the food, which refers to the immediate environment of any eating occasion. A study in 11 countries found that children's nutritional status from birth to age two was positively correlated with dietary diversity. A longitudinal study of 120 2-year-olds and their parents, followed for nine years, found that about 25% of the children had experienced some eating problems, such as reluctance to try new foods or insisting on a limited number of foods (innovation). These problems may cause them to become picky eaters.

ZEven though children with eating problems (e.g., sensitive people are exempted) may be at risk for behavioral problems as well as impaired growth and development, frequent exposure was found to be the main way for children to recognize food. Therefore, parents are advised to continue introducing food more than once and avoid getting discouraged or giving up. Some factors can affect children's eating habits, such as home food environment, social environment and contexts in which perceptions, knowledge and eating habits are formed. However, parents' eating patterns seem to have the greatest impact on children, as parents are the ones who shape the food environment at home, influence the way children think about food and accordingly, their food preferences and eating behavior. Beyond eating habits, family mealtime becomes the main social context in which children can eat with their parents, who are considered their main role models. Sharing meals with children, eating breakfast together regularly and encouraging children to eat healthy snacks with moderate restrictions have shown positive effects on children's eating behaviors. Moreover, a review study evaluated these methods and found them to be associated with higher consumption of dairy products, Fruits and Vegetables (FV), along with healthier breakfast patterns among children. Also, the same study stated that encouragement practice gives children the opportunity to make decisions, while moderate restriction practice helps parents provide clearer instructions to their children. Therefore, it is recommended to use a combination of these two methods so that both parents and children can use them [59-61].

The effect of parents' eating behaviors on children's eating habits: Food preferences are formed by a combination of complex interactions of genetic, familial and environmental factors. However, parents seem to have a high degree of control in modeling their children's eating behaviors. During the first year of life, children's eating patterns undergo a rapid transformation as parents are the ones who choose the family meals and act as eating models. Therefore, children tend to imitate their parents' behaviors and eating habits. Children's eating behaviors are influenced by social, physical and intrapersonal factors. In the family environment, parents create more than 70% of their children's eating behaviors through their consumption and the methods they follow to socialize with them. Several studies have been reviewed systematically investigating the impact of parental eating patterns on children, which summarize how parents' eating habits and eating styles are significantly related to children's eating behaviors, food preferences and consumption.

Eating Habits in Adolescents

Adolescence is associated with increased physical strength and motor coordination and this proper development requires adequate nutrition and physical activity. Bad eating habits and excessive consumption of foods containing sugar are associated with obesity. As teenagers grow, their bodies need more energy and nutrients to support their growth and development. Nutrition is important not only to support the body as it grows, but also to support brain function. The need for energy and nutrients is different at different ages. It even depends on the level of activity of adolescents. A healthy diet is very important for body health, especially during puberty. Various issues affect adolescents' eating, the most important of which is the social pressure on being thin. A teenager's image of his body and the importance of his weight and appearance reaches its peak at this age. Statistics show that 16% of girls between the ages of 15 and 18 have a tendency to lose weight, compared to boys, which is 3%. More than half of teenagers experience acne or pimples during adolescence. Acne during adolescence may be related to the consumption of certain foods, such as high-fat foods, sweets and chocolate as well as other factors such as stress and menstrual cycle in girls. The last two factors are more important than nutritional factors. In dealing with adolescents' nutritional issues, points such as rapid growth, puberty and psychological and personality changes should be considered. During this time, three aspects of growth are important: First, the intensity and speed of growth during puberty; second, the difference between the two genders in terms of time, growth and the resulting changes in the ratio of body composition; and finally, the differences between different people in terms of time and intensity of events and subsequent growth. In addition, it should be noted that the eating habits and type of food consumed by adolescents are influenced by various factors, including their environment, living conditions and personal development. For this reason, in order to counsel and train this group to improve their nutritional status, one should be equipped with aspects of social sciences and psychology in addition to nutrition knowledge.

Eating behavioral disorders: Eating disorders are among the most common psychiatric disorders in men and especially in women, which have many psychological and physical consequences for individuals. Eating disorders are one of the most common psychosomatic disorders that lead to many problems in physical health and mental functioning. It also impairs the affected person's quality of life and causes death. Clinical forms of eating disorders include anorexia nervosa and bulimia nervosa, which in the long run lead to various diseases such as heart disease, depression, osteoporosis and sexual problems. Eating disorders can cause nutrition-related disorders and endanger a person's health by changing the eating pattern and undesirable intake of nutrients. Eating

disorders are characterized by behaviors such as undereating, overeating, fasting, eating with vomiting and the use of anti-constipation and diuretics. The clinical forms of these disorders are anorexia nervosa and bulimia nervosa. Anorexia nervosa and bulimia nervosa and chronic eating disorders are often highly correlated comorbid. The prevalence of bulimia nervosa is higher than anorexia nervosa, which is about 90%-95% in women. In a study of Italian female adolescents, 2. 2.% had anorexia nervosa, 2.3% had anorexia nervosa, 8.3%had down. Syndrome and 10.7% were subclinical cases. Also, in Switzerland, the prevalence of anorexia nervosa was 0.7 and that of bulimia nervosa was 0.2 among girls aged 14-17. Studies show that the onset age of this disease has decreased compared to the past. In general, in Western countries, the rate of anorexia nervosa and bulimia nervosa among young women is reported to be 3% and 1%, respectively. In public belief, eating disorders are considered to be specific to the western culture, which emphasizes physical fitness, whereas it is of particular importance in developing Eastern societies such as Iran, Pakistan and Japan.

Bulimia nervosa: Bulimia nervosa is another form of eating disorder in which a person overeats. In this condition, patients often maintain their normal weight. Body image distortion is less in these patients than in patients with anorexia nervosa. Complications of bulimia nervosa are often associated with electrolyte disturbances, heartburn, gastric bleeding, intestinal disorders, enamel erosion, decreased heart rate, hypotension and decreased metabolic rate. The prevalence of eating disorders in Western societies is 6% for anorexia nervosa and 1% for anorexia nervosa. The symptoms of two subtypes of bulimia nervosa include nutritional binge eating.

Irregular meals: Skipping meals or irregular schedules are very common and it is usually observed that breakfast and lunch are skipped more often than dinner. Research has shown that several characteristics of eating behaviors, such as the number of meals, the distribution of time and meals during the day, skipping breakfast and the number of meals taken outside the home, are all related to dietary patterns that may affect a person's weight.

Excessive consumption of snacks: In addition to having no nutritional value, consuming snacks such as chips, puffs and carbonated drinks can lead to cardiovascular diseases, obesity and hypertension. On the other hand, school-aged children are more motivated to buy junk food due to the natural increase in their appetite, being influenced by friends and having access to pocket money.

Nutrition at School Age

Healthy and appropriate nutrition plays a significant role in the growth and health of children. Given the role and importance of nutrition in health and hygiene, the need for more attention to a proper and balanced diet is identified because school age nutrition plays a significant role in the learning and performance of students. Proper nutrition is one of the most critical factors in boosting students' learning and academic achievements. The issue of nutrition in children and adolescents, in addition to its health-promoting and vital role, is also essential in other aspects such as improving the growth progress. The amount of energy required by children is different due to the difference in their body size, mobility and growth rate and the more mobility and physical activity children have, the more energy they naturally need. Therefore, adequate nutrition has always been considered as one of the important axes of health in creating and establishing children's health and its impact on the growth and well-being of students can be, to a large extent, related to this.

Therefore, nutrition should contain the necessary energy to meet growth needs and energy for activities such as studying, group activities and sports. Therefore, parents, schools and healthcare centers should try replacing junk foods and high-calorie drinks with fruits or dried fruits, vegetables and sweets. Nutrition education in schools is a good way to increase awareness and correct wrong eating behaviors.

DISCUSSION

Physical Activity

Physical activity develops the quality of life at all ages, but adolescence is a transition period from childhood to adulthood. Life habits such as regular exercise naturally begin and continue during this period. Scientific reports reveal that a sedentary lifestyle in adolescence is an independent threatening factor that causes chronic health problems and reduces the quality of life in old age. During leisure time, the activity level of children and adolescents seemed to increase gradually and was not enough to cope with a sedentary lifestyle. When adolescents go to university from high school, they gain more independence compared to their everyday lives. Epidemiological findings have shown a significant reduction in physical activities due to increased independence at the high school and university levels. Physical activity maintains normal body mass and improves consumption, given that the lack of general knowledge about nutrition is the most important obstacle in implementing changes in eating habits. Body mass index is an index for the classification of obesity and is recommended as a screening tool for children and adolescents to determine whether a person is overweight or at risk of being overweight. The dietary behavior modification program has a very good effect on reducing adolescent body mass index. Parents, school teachers and other support groups should be encouraged to participate in behavior modification programs. Therefore, it is necessary to pay attention to developing motor abilities to train people for sports activities and living tasks. One of the important factors affecting motor abilities is a person's physical condition, which is affected by nutrition and physical activity. Poor health and malnutrition in childhood may affect the cognitive abilities necessary for learning and consequently achieving success in education. For this reason, it is particularly important to monitor and evaluate the nutritional status of this group of society (children and adolescents) of school age, who are passing through one of the most critical periods of growth

and development. Therefore, using the height and weight index to improve adolescents' nutritional status is becoming increasingly important in society. One of the most important international indicators for evaluating growth and physical health is measuring weight and height, determining body mass index and comparing them with standard curves.

Level of physical activity: The importance of Regular Physical Activity (RPA) on individuals' mental and physical health has been identified. Inadequate RPA levels among adolescents are a global concern leading to many non-contagious diseases such as metabolic syndrome, cardiovascular disease and obesity in adulthood. The world health organization recommends at least 60 minutes of Moderate to Vigorous Physical Activity (MVPA), which leads to increased heart rate and respiration in adolescents; nevertheless, 80% of individuals do not do these activities and only 8% of American adolescents do these. While in the case of Iranian adolescents, especially girls, the level of RPA is lower than this. According to the National Fitness and Physical Health Survey in 2010, it was reported that only 7.22% of Chinese students between the ages of 9-18 in elementary and high school are physically active for at least 60 minutes a day. Another national survey showed.

Physical activity and physiological changes related to body weight: With home quarantine (lack of physical activity) and increased calorie intake, weight gain has increased rapidly. Obesity is known as an important factor in the development of chronic diseases such as cardiovascular disease, hypertension, type 2 diabetes, stroke, osteoarthritis and certain cancers. According to the World Health Organization (WHO), obesity has become one of the most well-known medical diseases in students, characterized by the accumulation of excess fat to the extent that it may have negative health consequences. These statistics consistently over a decade show that being overweight has become an endemic disease for Pakistani students. One of the most important strategies to prevent obesity is exercise. Regular exercise can alter appetite-related hormones and improve body composition. Researchers consider moderate-intensity activity to be a very good factor in increasing fat oxidation. Also, high-intensity exercise can inhibit lipolysis. Obese people are more at risk for infections and various diseases, including corona disease. For this reason, exercise can have very positive effects on the health of obese people by changes in lipid profile and body composition. Researchers have also recently pointed out that the corona vaccine is ineffective in obese people. Therefore, exercise can be one of the most important factors in preventing infection from this virus and similar diseases.

Exercise and changes associated with body immunology: Nu merous studies have been conducted on this virus, but questions regarding the treatment methods of this disease remained unanswered. After the onset of the second wave of Coronavirus, staying at home increased, which had negative effects and ultimately increased the risk and worsened the health condition. So there is a strong health argument for continuing physical activity at home to stay healthy and maintain immune system function in the current unfavorable situation. It has been reported that exercise at home using a variety of safe, simple and easy to implement exercises is good for preventing Coronavirus transmission and maintaining fitness. In this regard, it is possible to use desirable and effective training methods, including walking at home, climbing stairs and doing sit-ups, because they are inexpensive and need little space. Maintaining regular physical activity and daily exercise in the safe environment of the home is an important strategy for a healthy life during the Coronavirus crisis, as exercise has been shown to be safe during the Coronavirus outbreak. It seems that prolonged exercise reduces the basal inflammatory status by reducing the circulation of inflammatory cytokines, at least in healthy subjects. High load exercising can increase the risk of respiratory infections and weakens the immune system. However, it should be noted that trained people are less prone to this due to the adaptation they have as a result of regular exercise, but those who do not have training have more severe immune system responses and suppression in intensive training.

CONCLUSION

A quarter of the world's population is under surveillance to slow down the spread of the Coronavirus (COVID-19) pandemic. This stressful situation has detrimental effects on physical and mental health. Globally, the outbreak of COVID-19 has forced many countries to implement strict social distancing measures and healthy diets. Many people have tried to boost their immune system by eating high-calorie foods and various multivitamins due to the fear of contracting the COVID-19 virus. In fact, people had an obsessive need to consume grains, vegetables, beans, pills and various supplements. Many people were influenced by cyberspace and the media and consumed different foods without any knowledge or scientific support. On the other hand, social distancing, telecommuting and video calls, which mostly show people's faces, have caused many to pay less attention to their weight and body image and look at themselves less in the mirror. In the near future, all of these cases may cause eating disorders at different levels among people, which requires further study by researchers.

The psychological and physical effects of the pandemic and the potential effects on consumers' eating and purchasing behavior "More food a tool to reduce stress" is the hypothesis that the pandemic has directly affected the individual's mind. Even in areas with a relatively low risk of infection, the population was at increased risk for widespread communications and media reporting in 2020, which itself was a related psychological stressor. Moreover, a significant portion of the population was affected by unemployment or short-time work or worried about possible job loss, which could well affect mental health. People were in quarantine, working remotely and children were studying at home. While quarantine showed an adverse effect on some behaviors during leisure time, such as a decrease in intensive physical activity and an increase in sedentary behavior, quarantine also showed

a beneficial effect by increasing walking time and doing moderate physical activity.

Furthermore, the COVID-19 quarantine led to a lack of positive eating habits and reinforced obesogenic eating habits. Children and adolescents faced quarantine challenges related to eating habits, sleeping time, physical inactivity and stress. As a result, the COVID-19 quarantine affected children's and adolescents' lifestyles. In addition to the declining physical activity of children and adolescents in our society, their food tastes have shifted to high-calorie, low value foods instead of traditional foods and healthy snacks. The nutritional needs of children and adolescents are very important for the community's health and in the case of continuing inappropriate nutritional behaviors, it causes the formation of disorders such as chronic malnutrition and anemia, which affects their health and growth. Overall, this study concluded that the increase in food consumption, time spent watching TV, playing computer games, cell phone use and the decrease in physical activity or even school closures, caused changes in children and adolescents' eating habits, nutrient intake, weight gain and the lack of physical activity during the quarantine. Thus, children and adolescents are critical target groups and the results warrant further research in the future to design plans and programs to address the negative consequences of being overweight and obese, which are caused by various factors of obesity during the COVID-19 quarantine restrictions.

REFERENCES

1. Agostoni C, Braegger C, Decsi T, Kolacek S, Koletzko B, et al. (2009) Breast-feeding: A commentary by the ESPGHAN Committee on Nutrition. J Pediatr Gastroenterol Nutr. 49(1):112-125.
2. Albuquerque D, Nobrega C, Manco L, Padez C. (2017) The contribution of genetics and environment to obesity. Br Med Bull. 123(1):159-173.
3. Arimond M, Ruel MT (2004) Dietary diversity is associated with child nutritional status: Evidence from 11 demographic and health surveys. J Nutr. 134(10): 2579-2585.
4. Banik R, Naher S, Pervez S, Hossain MM (2020) Fast food consumption and obesity among urban college going adolescents in Bangladesh: A cross-sectional study. Obes Med. 17:100161.
5. Bird L (2020) Exercise lowers leptin and leukocytosis. Nat Rev Immunol. 20(1):2-3.
6. Blissett J (2011) Relationships between parenting style, feeding style and feeding practices and fruit and vegetable consumption in early childhood. Appetite. 57(3):826-831.
7. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, et al. (2020) The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. Lancet. 395(10227):912-920.
8. Calestine J, Bopp M, Bopp CM, Papalia Z (2017) College student work habits are related to physical activity and fitness. Int J Health Sci. 10(7):1009.
9. Campbell JP, Turner JE (2018) Debunking the myth of exercise-induced immune suppression: Redefining the impact of exercise on immunological health across the lifespan. Front Immunol. 648.
10. Carayanni V, Vlachopapadopoulou E, Koutsouki D, Bogdanis GC, Psaltopoulou T, et al. (2021) Effects of nutrition and physical activity habits and perceptions on Body Mass Index (BMI) in children aged 12-15 years: A cross-sectional study comparing boys and girls. Children. 8(4):277.
11. Chamay-Weber C, Narring F, Michaud PA (2005) Partial eating disorders among adolescents: A review. J Adolesc Health. 37(5):416-426.
12. Cucinotta D, Vanelli M (2020) WHO declares COVID-19 a pandemic. Acta bio-medica: Atenei Parmensis. 91(1): 157.
13. Demir D, Bektas M (2021) The effect of an obesity prevention program on children's eating behaviors, food addiction, physical activity and obesity status. J Pediatr Nurs. 61:355-363.
14. Di Renzo L, Gualtieri P, Pivari F, Soldati L, Attina A, et al. (2020) Eating habits and lifestyle changes during COVID-19 lockdown: An Italian surveyJ Transl Med. 18(1): 1-5.
15. Egli T, Bland HW, Melton BF, Czech DR. Influence of age, gender and race on college students' exercise motivation of physical activity. J Am Coll Health. 2011 Apr 8;59(5): 399-406.
16. Farren GL, Zhang T, Martin SB, Thomas KT (2017) Factors related to meeting physical activity guidelines in active college students: A social cognitive perspective. J Am Coll Health. 65(1):10-21.
17. Favaro A, Caregaro L, Tenconi E, Bosello R, Santonastaso P (2009) Time trends in age at onset of anorexia nervosa and bulimia nervosa. J Clin Psychiatry. 70(12):21711.
18. Furnham A, Adam-Saib S (2001) Abnormal eating attitudes and behaviours and perceived parental control: A study of white British and British-Asian school girls. Soc Psychiatry Psychiatr Epidemiol. 36(9):462-470.
19. Gallo LA, Gallo TF, Young SL, Moritz KM, Akison LK (2020) The impact of isolation measures due to COVID-19 on energy intake and physical activity levels in Australian university students. Nutrients. 12(6):1865.
20. Gasmi A, Noor S, Tippairote T, Dadar M, Menzel A, et al. (2020) Individual risk management strategy and potential therapeutic options for the COVID-19 pandemic. Clin Immunol. 215:108409.
21. Grabia M, Markiewicz-Zukowska R, Puscion-Jakubik A, Bielecka J, Nowakowski P, et al. (2020) The nutritional and health effects of the COVID-19 pandemic on patients with diabetes mellitus. Nutrients. 12(10):3013.
22. Guthold R, Cowan MJ, Autenrieth CS, Kann L, Riley LM (2010) Physical activity and sedentary behavior among

schoolchildren: A 34-country comparison. J Pediatr. 157(1):43-49.

23. Hamad HJ, Abu-Hassouneh DT, Ibrahim MO, Al-Islam M, Faris E. Prevalence of obesity among Jordanian school-aged adolescents in greater Amman. Prevalence. 2016;33:91-96.
24. Herzog DB, Sacks NR, Keller MB, Lavori PW, Von Ranson KB, et al. (1993) Patterns and predictors of recovery in anorexia nervosa and bulimia nervosa. J Am Academy Child Adolescent Psychiatr. 32(4):835-842.
25. Jakicic JM, Winters C, Lang W, Wing RR (1999) Effects of intermittent exercise and use of home exercise equipment on adherence, weight loss and fitness in overweight women: A randomized trial. JAMA. 282(16): 1554-1560.
26. Jakobsson J, Malm C, Furberg M, Ekelund U, Svensson M (2020) Physical activity during the coronavirus (COVID-19) pandemic: Prevention of a decline in metabolic and immunological functions. Front Sports Act Living. 57.
27. Jansen E, Mulkens S, Jansen A (2007) Do not eat the red food: Prohibition of snacks leads to their relatively higher consumption in children. Appetite. 49(3):572-577.
28. Keel PK, Klump KL (2003) Are eating disorders culture-bound syndromes? Implications for conceptualizing their etiology. Psychol Bull. 129(5):747.
29. Keski-Rahkonen A, Kaprio J, Rissanen A, Virkkunen M, Rose RJ (2003) Breakfast skipping and health-compromising behaviors in adolescents and adults. Eur J Clin Nutr. 57(7):842-853.
30. Khosravi N, Hanson E, Farajivafa V, Agha-Alinejad H, Haghighat S, et al. (2018) Changes in monocyte populations following acute aerobic exercise in breast cancer survivors. J Breast Cancer. 11(1):7-16.
31. Lee S, Lee AM (2000) Disordered eating in three communities of China: A comparative study of female high school students in Hong Kong, Shenzhen and rural Hunan. Int J Eat Disord. 27(3):317-327.
32. Marcus MD, Levine MD, Kalarchian MA, Wisniewski L (2003) Cognitive behavioral interventions in the management of severe pediatric obesity. Cogn Behav Pract. 10(2):147-156.
33. Martinez-Ferran M, de la Guia-Galipienso F, Sanchis-Gomar F, Pareja-Galeano H (2020) Metabolic impacts of confinement during the COVID-19 pandemic due to modified diet and physical activity habits. Nutrients. 12(6):1549.
34. Mascola AJ, Bryson SW, Agras WS (2010) Picky eating during childhood: A longitudinal study to age 11 years. Eat Behav. 11(4):253-257.
35. Mihashi M, Otsubo Y, Yinjuan X, Nagatomi K, Hoshiko M, et al. (2009) Predictive factors of psychological disorder development during recovery following SARS outbreak. Health Psychol. 28(1):91.
36. Mokhtarzade M, Ranjbar R, Majdinasab N, Patel D, Molanouri Shamsi M (2017) Effect of aerobic interval training on serum IL-10, TNFα and adipokines levels in women with multiple sclerosis: Possible relations with fatigue and quality of life. Endocrine. 57(2):262-271.
37. Molanouri Shamsi M, Hassan ZM, Quinn LS, Gharakhanlou R, Baghersad L, et al. (2015) Time course of IL-15 expression after acute resistance exercise in trained rats: Effect of diabetes and skeletal muscle phenotype. Endocrine. 49(2):396-403.
38. Moreno LA, Rodriguez G (2007) Dietary risk factors for development of childhood obesity. Curr Opin Clin Nutr Metab Care. 10(3):336-341.
39. Musaiger AO, Al-Mannai M, Al-Haifi AR, Nabag F, Elati J, et aL. (2016) Prevalence of overweight and obesity among adolescents in eight Arab countries: Comparison between two international standards (ARABEAT-2). Nutr Hosp. 33(5):1062-1065.
40. Ng M, Fleming T, Robinson M, Thomson B, Graetz N, et al. (2014) Global, regional and national prevalence of overweight and obesity in children and adults during 1980-2013: A systematic analysis for the Global Burden of Disease Study 2013. Lancet. 384(9945):766-781.
41. Owen N, Sparling PB, Healy GN, Dunstan DW, Matthews CE (2010) Sedentary behavior: Emerging evidence for a new health risk. Mayo Clin Proc. 85(12):1138-1141.
42. Pedersen BK, Rohde T, Zacho M (1996) Immunity in athletes. J Sports Med Phys Fitness. 36(4):236-245.
43. Phillipou A, Meyer D, Neill E, Tan EJ, Toh WL, et al. (2020) Eating and exercise behaviors in eating disorders and the general population during the COVID-19 pandemic in Australia: Initial results from the COLLATE project. Int J Eat Disord. 53(7):1158-1165.
44. Pietrobelli A, Pecoraro L, Ferruzzi A, Heo M, Faith M, et al. (2020) Effects of COVID-19 lockdown on lifestyle behaviors in children with obesity living in Verona, Italy: A longitudinal study. Obesity. 28(8):1382-1385.
45. Reyes-Olavarria D, Latorre-Roman PA, Guzman-Guzman IP, Jerez-Mayorga D, Caamano-Navarrete F, et al. (2020) Positive and negative changes in food habits, physical activity patterns and weight status during COVID-19 confinement: Associated factors in the Chilean population. Int J Environ Res Public Health. 17(15):5431.
46. Reynolds DL, Garay JR, Deamond SL, Moran MK, Gold W, et al. (2008) Understanding, compliance and psychological impact of the SARS quarantine experience. Epidemiol Infect. 136(7):997-1007.
47. Rostami-Moez M, Rezapur-Shahkolai F, Hazavehei SM, Karami M, Karimi-Shahanjarini A, et al. (2017) Effect of educational program, based on PRECEDE and trans-theoretical models, on preventing decline in regular physical activity and improving it among students. J Res Med Sci. 17(2):375.
48. Rundle AG, Park Y, Herbstman JB, Kinsey EW, Wang YC (2020) COVID-19 related school closings and risk of weight gain among children. Obesity (Silver Spring, Md.). 28(6):1008.
49. Scaglioni S, Arrizza C, Vecchi F, Tedeschi S (2011) Determinants of children's eating behavior. Am J Clin Nutr. 94(6):2006-2011.

50. Scaglioni S, De Cosmi V, Ciappolino V, Parazzini F, Brambilla P,et al. (2018) Factors influencing children's eating behaviours. Nutrients. 10(6):706.
51. Sidor A, Rzymski P (2020) Dietary choices and habits during COVID-19 lockdown: Experience from Poland. Nutrients. 12(6):1657.
52. Sutherland R, Campbell E, Lubans DR, Morgan PJ, Okely AD, et al. (2016) 'Physical Activity 4 Everyone'school-based intervention to prevent decline in adolescent physical activity levels: 12 month (mid-intervention) report on a cluster randomised trial. Br J Sports Med. 50(8):488-495.
53. Utter J, Scragg R, Mhurchu CN, Schaaf D (2007) At-home breakfast consumption among New Zealand children: Associations with body mass index and related nutrition behaviors. J Am Diet Assoc. 107(4):570-576.
54. Velavan TP, Meyer CG (2020) The COVID-19 epidemic. Trop Med Int Health. 25(3):278.
55. Wang C, Horby PW, Hayden FG, Gao GF (2020) A novel coronavirus outbreak of global health concern. Lancet. 395(10223):470-473.
56. Weissman RS, Bauer S, Thomas JJ (2020) Access to evidence-based care for eating disorders during the COVID-19 crisis. Int J Eat Disord. 53(5):639-646.
57. Yılmaz C, Gokmen V (2020) Neuroactive compounds in foods: Occurrence, mechanism and potential health effects. Food Res Int. 128:108744.
58. Yoon MK, Kim SY, Ko HS, Lee MS (2016) System effectiveness of detection, brief intervention and refer to treatment for the people with post-traumatic emotional distress by MERS: A case report of community-based proactive intervention in South Korea. Int J Ment Health Syst. 10(1):1-5.
59. Zeng X, Zhang Y, Kwong JS, Zhang C, Li S, et al. The methodological quality assessment tools for preclinical and clinical studies, systematic review and meta-analysis and clinical practice guideline: A systematic review. J Evid Based Med. 8(1):2-10.
60. Zhou Z, Dong S, Yin J, Fu Q, Ren H, et al. (2018) Improving physical fitness and cognitive functions in middle school students: Study protocol for the Chinese childhood health, activity and motor performance study (Chinese CHAMPS). Int J Environ Res. Public Health. 15(5):976.
61. Zhu W (2020) Should and how can, exercise be done during a coronavirus outbreak? An interview with Dr. Jeffrey A. Woods. J Sport Health Sci. 9(2):105.