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IS THE COVID-19 PANDEMIC AN OPPORTUNITY TO IMPROVE ADOLESCENTS' DIET? AN EXPLORATORY STUDY IN TAIWAN

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**Is the COVID-19 Pandemic an Opportunity to Improve Adolescents' Diet?
An Exploratory Study in Taiwan**

Synopsis:

Adolescence is a vital time period for laying down good health foundations. One's eating behaviors can be easily influenced by external factors during this stage. Since May 2022, Taiwan has experienced an upsurge of COVID-19 cases, which forced students to stay home and take part in online learning. This drastic change could be a positive influence on or a threat to adolescents' diets. The main aim of this study is to investigate the changes in adolescents' dietary patterns after the outbreak.

Is the COVID-19 Pandemic an Opportunity to Improve Adolescents' Diet?

An Exploratory Study in Taiwan

Abstract

In May 2022, Taiwan experienced an unprecedented COVID-19 outbreak. Since then, secondary school students had to stay home and take part in online learning. This study attempts to investigate the impact of the outbreak on the dietary patterns of adolescents. Their changes in the consumption of healthier and unhealthier foods are evaluated through an online questionnaire. A total of 269 students (Grade 7-12) from secondary schools in Tainan, Taiwan participated in this study. The results of this study show that, under the circumstance of a “soft” lockdown, the influence of the outbreak on adolescents' diet is more positive than negative because the percentage of reported positive changes is twice that of reported negative changes. However, the percentage of negative responses found in this study was not small enough to be ignored: about a quarter of the responses show an increased consumption of sweets, fried food, processed food, and sweetened beverages. The study also found that adolescents make observable improvements in food hygiene after the outbreak with a mean score of 4.09 on a 5-point scale, but not as much change was found in the awareness of food quality and healthy eating (3.13 out of 5).

Keywords: Adolescents, COVID-19, diet, online learning

1. Introduction

On January 21, 2020, the first SARS-CoV-2 (COVID-19) case was identified in Taiwan. Based on previous experience dealing with severe acute respiratory syndrome (SARS) in 2003, the Taiwan government enacted multiple preventative measures, including border control, rapid antigen testing, quarantine regulations, and mask policy, in order to block viral transmission during early stages of COVID-19 (Chiu et al., 2021). Statistical data provided by the Taiwan Centers of Disease Control (TCDC) suggested that those measures were considerably effective and local COVID-19 transmission was within control; the number of daily local COVID-19 cases was mostly under 100. However, starting from April 2022, local cases increased substantially: On April 1st, there were 104 local cases, the first record in 2022 that exceeded 100. Two weeks later, the daily local cases exceeded 1000, and at the end of April, the number of cases went beyond 10,000. Finally, it reached the peak on May 27, with a number of 94,808 cases (Taiwan National Infectious Disease Statistics System, n.d.). The sudden increase of daily local COVID-19 cases at the end of May forced city governments, in succession, to announce “virtual class” recommendations, targeting primary and secondary schools (Strong, 2022).

Conventional preventative and control methods previously mentioned are direct pathways to contain the spread of COVID-19. Nevertheless, maintaining high nutritional status is key to supporting individuals’ immune systems to function optimally and protect them from noxious environment agents, such as SARS-CoV-2, the coronavirus causing COVID-19 (Calder, 2020). Nutrition plays an important role in both innate and adaptive immunity (Kim et al., 2021).

A few studies have linked certain healthy diets with lower risks of COVID-19 infections and having less severe symptoms (Angelidi et al., 2021; Kim et al., 2021; Merino et al., 2021; Sharp, 2022; Thomas, 2022). Studies have revealed that a plant-based diet or a pescatarian diet

can lower one's risk of being infected with COVID-19 or developing moderate-to-severe COVID-19 symptoms (Kim et al., 2021; Merino et al., 2021). A plant-based diet involves the consumption of more total vegetables and plant proteins while a pescatarian diet incorporates higher amounts of fish and seafood. Some other reviews have documented the Mediterranean diet, known for its preventive effect against cardiovascular diseases and type 2 diabetes, as a potential nutritional approach to attenuate the severity of COVID-19 infections, serving as both a preventive measure and treatment (Angelidi et al., 2021; Thomas, 2022; Sharp, 2022). The Mediterranean diet consists mainly of whole grains, vegetables, legumes, fruit, nuts, seeds, and olive oil, mostly consistent with the foods reported in the plant-based and pescatarian diet in Merino's research (Mediterranean Diet for Heart Health - Mayo Clinic, 2021).

With the possible benefits of keeping a healthy diet during the COVID-19 pandemic in mind, people may become more willing in seeking and developing healthy diets in order to protect themselves (Głabska et al., 2020; Vidal et al., 2021). COVID-19 has the potential to encourage positive changes in eating habits (Vidal et al., 2021). A few studies have shown positive shifts in eating habits during lockdowns (Lamy et al., 2022; Martín-Rodríguez et al., 2022; Ruiz-Roso et al., 2020; Vidal et al., 2021). An increase in home-cooking and consumption frequency of fruit, vegetables, edible seeds, dairy products, and olive oil, along with a reduction in the consumption of take-away foods and ultra-processed products (e.g. cookies, sweets and chocolate, sweetened beverages) are reported (Lamy et al., 2022; Vidal et al., 2021). Additionally, a higher priority for purchasing fresh fruits and vegetables is observed (Lamy et al., 2022). Two possible causes for this positive diet change are increased time availability, due to stay-at-home recommendations, and restricted access to prepared foods, due to restaurants being closed. People may spend more time at home, thus encouraging them to prepare their own meals and rely less on processed food and meals consumed outside of homes (Vidal et al., 2021).

On the other hand, a few studies (Ruiz-Roso et al., 2020; Vidal et al., 2021), including those that recorded shifts to healthy eating, have also reported negative changes in eating behaviors during the COVID-19 pandemic, especially during lockdowns. In a research study targeting adolescents in Italy, Spain, Chile, Colombia and Brazil, sweet food and fried food intakes were found to have increased significantly during COVID-19 confinement (Ruiz-Roso et al., 2020). Similarly, greater quantity of food consumption, increase in the consumption frequency of ultra-processed products, and a decrease in the consumption of natural products associated with healthy eating were shown in a study on the population of Uruguay (Vidal et al., 2021). An underlying reason suggested for the shift towards unhealthy eating behaviors is that such habits can draw attention away from negative emotions generated by isolation and confinement in homes, such as boredom, stress, and anxiety (Lamy et al., 2022; Rogers et al., 2021). In addition, convenient food access during the prolonged stay at home can provoke more overeating behaviors, such as the consumption of food without the feeling of hunger (Martín-Rodríguez et al., 2022).

It seems that both positive and negative changes in eating behaviors are possible during the COVID-19 pandemic. Studies that show those results were mostly conducted with the target population under strict lockdowns or certain extents of confinements. However, what Taiwan has gone through since the May 2022 COVID-19 outbreak is a Level 3 “soft” or voluntary lockdown (Tang, 2021). Taiwanese adolescents, the target population of this study, spend most of their time at home because of the online learning recommendations from the Education Bureau, and such a situation shares similar characteristics to a lockdown; however, they can still leave their houses at will. The aim of this study is to investigate the possible change in adolescents’ eating behavior after the COVID-19 outbreak that occurred in May 2022 in Taiwan. The influence of the COVID-19 lockdown on adolescents’ eating behaviors suggested in previous studies may not reappear under the situation of a soft lockdown.

The present study took adolescents as the target population because adolescence is a crucial stage for establishing the foundation of one's health, and the habits formed as a teenager may carry over into adulthood and last a lifetime (Adolescent health, n.d.).

2. Materials and Method

2.1. *Participants*

A total of 269 students from various junior high schools and senior high schools in Tainan, Taiwan participated in this study. They were recruited through online communities, recommendations of teachers in schools and direct invitation from the researcher. Participants are distributed across from grade 7 through grade 12, with a very close ratio of female (N=139) to male (N=130).

2.2. *Questionnaire*

The questionnaire was reviewed by three family doctors and three nutritionists before distribution. The final questionnaire was revised according to these experts' suggestions. Suggestions were given on the food groups we should investigate and their respective subcategories and on the wording of questions. A total of 274 responses were collected between June and July 2022. Five surveys were used as test runs by the questionnaire distributors, so the responses were excluded from the results. A total of 269 responses were considered for analysis.

The questionnaire was constructed using a Google Form. To prevent participants from filling in the questionnaire more than once, they were required to sign in to their Google accounts to access the questionnaire. Due to the COVID-19 outbreak, all participants filled out the survey online. No paper form of the questionnaire was provided and no compensation was given for completing the questionnaire.

Participants were required to fill in their school, grade, and gender at the beginning of the questionnaire, but filling their name in was optional. The questionnaire consisted of three parts.

2.2.1. Change in food intake

The first part of the questionnaire consists of questions concerning respondents' change in diet after COVID-19 outbreak. Different food groups were addressed based on the contents of MyPlate and a healthy diet guideline from the World Health Organization (WHO): six groups of *healthier* food and six groups of *unhealthier* food. The healthier foods fall within the five food groups in MyPlate: Fruits, Vegetables, Grains, Protein Foods, and Dairy, and also includes oil (Chang, 2021). In addition, wholegrains, legumes, fresh fruit and vegetables, white meats, and moderate amounts of unsaturated fats are considered healthier foods, according to the WHO guideline. On the contrary, the intake of sweets, sugary drinks, processed foods with high amounts of salt or saturated fats, and baked or fried foods should be limited. (#HealthyAtHome - Healthy Diet, n.d.).

Whole grains, vegetables, fruits, protein foods (legumes, fish, egg, and poultry/meat), dairy products, oils, nuts and seeds are our six *healthier* food groups. Fried food, barbecued food, pickled food, canned and processed foods, sweets and desserts, and sweetened beverages are the six *unhealthier* food groups we considered.

Images and examples are shown along with each question, which we believe should help participants to understand the specific foods asked about. In addition, questions on healthier and unhealthier foods are mixed randomly to prevent participants from noticing the intention of this study, which would compromise the reliability of their responses. Changes of food intake is assessed on a five-point scale, where 1 = significantly decreased, 2 = slightly decreased, 3 = no change, 4 = slightly increased, and 5 = significantly increased.

2.2.2. Awareness of food quality and healthy eating behaviors

The second part consists of six questions that describe positive changes related to healthy eating behaviors and the awareness of food quality after the outbreak, as shown in Table 4. Participants rate their level of agreement to those statements on a five-point scale, ranging from 1 = strongly disagree to 5 = strongly agree. For these questions, the Cronbach's alpha which estimates the scale's reliability is 91.4 %.

2.2.3. Awareness of food hygiene

The third part consists of six questions that describe food hygiene behaviors practiced conducted after the outbreak, such as not sharing food with peers. Participants also rate their level of agreement with those statements on a five-point scale, ranging from 1 = strongly disagree to 5 = strongly agree. For these questions, the Cronbach's alpha which estimates the scale's reliability is 85.3%.

3. Results and Discussion

3.1. The changes in healthier food consumption

In the first part of the questionnaire, the changes in the consumption of foods after COVID-19 outbreak are assessed on a five-point scale (1 = significantly less and 5 = significantly more). Table 1 shows that the average response of all participants for intake of *healthier* foods is 3.26 out of 5, suggesting that adolescents increased their intake of *healthier* foods following the COVID-19 outbreak. This can be supported by the percentage of participants who responded "increased" (>3) and "decreased" (<3). As shown in Table 1, responses that correspond to an increased intake (>3) of healthier foods made up 32.34% of the percentages, which is much higher than the reported percentage of decreased intake (<3), 13.75%.

Among the six groups of healthier foods, the groups that saw the highest reported amount of increased intake were fruits (50.56%), followed by dairy (45.72%) and vegetables

(31.23%). Similar results were shown in other studies (Lamy et al., 2022; Vidal et al, 2021): an increased consumption of fruit, vegetables, and dairy products was also reported. The percentages of respondents who increased their intake of whole grains and protein foods (legumes, fish, egg, and poultry/meat) were 23.05% and 28.05%, respectively. Although the increased intake of those two food groups cannot compare with that of vegetables, fruits, and dairy products, the percentages of participants with an increased intake (23.05%, 28.05%) are still higher than that of those with a decreased intake (16.36%, 11.52%) for both food groups.

In Taiwan, it is a general belief that eating out is not safe during the COVID-19 pandemic and home cooking has become a more preferable option. According to a survey from Taiwan Trend Research on Taiwanese population, about 75.8 % of respondents (N=2645) reported that they cooked more frequently after Level 3 COVID-19 alert was enacted (Peng, 2021). A study on French population revealed a correlation between home cooking and an increased consumption of vegetables and ‘protein foods’ such as legumes, fish, and seafood (Pfeifer et. al., 2021). Thus, the increased consumption of vegetables and protein foods reported in this study may be the result of a transition to home cooking. As for the increased consumption of fruits and dairy products, this could be due to ease of access at home, since both foods are usually stored in refrigerators.

Table 1
Changes in intake amount of six *healthier* food groups after COVID-19 outbreak (N=269)

Category of healthier foods	Mean	# of participants		
		Decreased (%)	No change (%)	Increased (%)
Whole grains	3.12	16.36%	60.59%	23.05%
Protein Foods	3.22	11.52%	60.22%	28.25%
Vegetables	3.28	10.04%	58.74%	31.23%
Fruits	3.57	9.29%	40.15%	50.56%
Dairy products	3.43	12.64%	41.64%	45.72%
Oils, nuts and seeds	2.91	22.68%	62.08%	15.24%
Total	3.26	13.75%	53.90%	32.34%

Note: Responses that were less than 3 in the first part of the questionnaire fall into the *Decreased* category, whereas those that were greater than 3 are in the *Increased* category. *No change* indicates that the responses were equal to 3.

Finally, oils, nuts, and seeds is the only category in which a higher percentage of participants reported having a decreased intake than an increased intake. We suspect this is due to the general belief that an excess of oil intake is bad for health (Why Excess Oil in Food Is Bad for Your Health, 2022).

3.2. The changes in unhealthier food consumption

The average intake of unhealthier foods after the outbreak is 2.8 out of 5 (1 = significantly less and 5 = significantly more).

For all six types of unhealthier food, the 'no change' group made up the highest percentage of responses. For five out of the six types of unhealthier food, more adolescents decreased consumption than increased consumption, but the same percentage of participants decreased and increased intake of canned and processed foods. For canned and processed foods, the number of participants (24.54%) that showed a decreased and increased intake are equivalent, whereas for the other five groups of unhealthier foods, more adolescents had a decreased intake (>30%) than an increased intake. These results suggest that adolescents decreased their intake of unhealthier foods after the COVID-19 outbreak.

After the outbreak, a small number of respondents increased their intake of pickled foods (7.06%) and barbecued foods (14.13%), but for sweets/pastries (26.77%), fried foods (24.54%), processed foods (24.54%), and sugar-sweetened beverages (23.79%), approximately a quarter of the recruited adolescents reported an increase in consumption. The trend of increased intake of processed food found in this research was also seen in a study conducted by Vidal. (Vidal et al, 2021). When Taiwanese students started online learning, they stopped receiving "nutritious school lunch" (Lin, 2013) from their schools and consequently had to prepare their own lunch, as many parents still had to go to work. This possibly increased the chance for them to consume more processed foods, as processed foods are more convenient and easier to prepare. The report of increased intake of fried food and sweets in this study is

similar to that of a research study targeting adolescents under strict lockdown requirements in Italy, Spain, Chile, Colombia and Brazil (Ruiz-Roso et al., 2020). This suggests that although Taiwan was under a soft lockdown, the negative impact it had on adolescents' food choice is similar to that under a strict lockdown. The increased intake of unhealthier foods, or comfort foods, may be due to adolescents' need to divert their attention from negative emotions, such as boredom, stress, and anxiety, produced by COVID-19 confinement (Lamy et al., 2022; Ruiz-Roso et al., 2020). Staying at home for too long may be a negative influence in developing healthy eating habits.

Table 2
Changes in intake amount of six unhealthier food groups after COVID-19 outbreak (N=269)

Category of unhealthier foods	Mean	# of participants		
		Decreased (%)	No change (%)	Increased (%)
Sugar-sweetened beverages	2.88	30.48%	45.72%	23.79%
Sweets/pastries	2.85	35.32%	37.92%	26.77%
Fried food	2.81	34.94%	40.52%	24.54%
Pickled food	2.65	32.34%	60.59%	7.06%
Barbecued food	2.68	36.06%	49.81%	14.13%
Processed food	2.95	24.54%	50.93%	24.54%
Total	2.80	32.28%	47.58%	20.14%

Note: Responses that were less than 3 in the first part of the questionnaire fall into the *Decreased* category, whereas those that were greater than 3 are in the *Increased* category. *No change* indicates that the responses were equal to 3.

A summary of changes in the intake of healthier and unhealthier foods is presented in Table 3, based on data shown in Table 1 and Table 2. Responses that scored higher than 3 in the previous five-point scale correspond to a *positive change for healthier foods* and a negative change for unhealthier foods in Table 3. Responses that scored 3 indicate *no change*. All responses for healthier and unhealthier foods are combined and analyzed, as shown in the *all foods* section.

According to Table 3, 50.74% of responses in the first part of the questionnaire were *no change*. 32.31% were *positive change*, and 16.95% were *negative change*. Among those that did report a difference, the number of responses indicating a positive change was roughly twice that of responses indicating a negative change. It can be concluded that the influence of

the COVID-19 outbreak on adolescents' diet has been more positive than negative under the soft lockdown situation of Taiwan.

It can also be seen from Table 3 that there are more neutral responses in healthier foods (53.90%) than in unhealthier foods (47.58%). This indicates that the intake of unhealthier foods was more likely to change after the outbreak.

Table 3
Summary of change in food intake

Category of foods	Mean	# of responses		
		Negative change (%)	No change (%)	Positive change (%)
Healthier	3.26	13.75%	53.90%	32.34%
Unhealthier	2.80	20.14%	47.58%	32.28%
All Foods		16.95%	50.74%	32.31%

Note: For healthier foods, an increased intake is a positive change, and a decreased intake is a negative change. On the contrary, for unhealthier foods, an increased intake is a negative change, while a decreased intake is a positive change.

3.3. Awareness of food quality and healthy eating

The second part of the questionnaire investigated participants' awareness of food quality and practice of healthy eating. Questions pertain to paying attention to the source of food, nutrition content, and a balanced diet. The participants were asked to what extent they agreed with the statements presented on a 5-point scale (1 = strongly disagree, 5 = strongly agree). There are six questions in total in this part.

The average score for this part is 3.13 (out of 5), as shown in Table 4. The highest number of respondents reported paying more attention to information regarding healthy eating (51.67%), followed by the diversity and balance of their diet (43.12%). Fewer respondents reported paying attention to the locality, seasonality, and labeling of food as exhibited in questions Q02 to Q05. That is, after the outbreak, adolescents began to pay more attention to information on healthy, balanced, and diversified diets, but less on the seasonality, the place of origin, and the labeling of foods. A possible explanation for this discrepancy could be that

adolescents are usually not the ones responsible in households for purchasing daily necessities, such as fresh fruits and vegetables, and are not familiar with methods of choosing products.

Table 4
Awareness of food quality and healthy eating after COVID-19 outbreak (N=269)

Question:	Mean	# of participants			
		Disagree (%)	Neutral (%)	Agree (%)	
After the COVID-19 outbreak,					
Q01	I paid more attention to the diversity and balance of my diet (including whole grains, vegetables, fruits, legumes, fish, meat, milk, less salt, oil, and sugar).	3.43	18.22%	38.66%	43.12%
Q02	I would read the nutrition labels when buying food	3.04	30.11%	38.29%	31.60%
Q03	I chose to buy local and in season fresh produce.	3.11	27.51%	39.78%	32.71%
Q04	I would check for clean labels when buying agricultural products.	2.72	37.55%	40.15%	22.30%
Q05	I would check for traceability labels when buying the agriculture products.	2.96	32.71%	36.43%	30.86%
Q06	I started paying attention to information regarding healthy eating.	3.54	14.87%	33.46%	51.67%
Total		3.13	26.83%	37.79%	35.38%

Note: Responses that were less than 3 in the second part of the questionnaire fall into the *Disagree* category, whereas those that were greater than 3 are in the *Agree* category. *Neutral* indicates that the responses were equal to 3.

3.4. Awareness of food hygiene

The third part of the questionnaire served to assess whether adolescents improved their food hygiene after the COVID-19 outbreak. The participants were asked to what extent they agreed with the statements presented on a five-point scale (1 = strongly disagree, 5 = strongly agree). There are six questions in this part.

As shown in Table 5, the average score for food hygiene is 4.09 (out of 5), indicating that adolescents in Tainan were more aware of the importance of hygiene and took actions to ensure the cleanliness of food they eat after the COVID-19 outbreak. Respondents on average agreed that they eat while walking less frequently (mean score: 4.40), which may be related to the Taiwan government's requirement to wear masks in public places. In addition, participants also admitted that they will "always wash their hands before eating" (mean score: 4.25) and "avoid touching food with their hands" (4.04) after the COVID-19 outbreak. While statements related to avoiding talking while eating (3.82) and sharing food with others (3.81) had a lower mean value, they are still higher than the average score of 3. This suggests that after the

outbreak, adolescents did attempt to abandon their usual eating habits and practice stricter hygiene measures, but they could not completely avoid sharing food with companions or chatting while eating.

The average score for food hygiene (4.09) is much higher than the average score for healthy eating practices (3.13). When comparing the responses to questions in these two parts, it can also be found that every agreement score in the food hygiene section is higher than those in the healthy eating questions. The COVID-19 outbreak led adolescents to become more aware of food hygiene than of food quality and healthy eating, and their actions changed accordingly.

Table 5
Awareness of food hygiene after COVID-19 outbreak (N=269)

Questions:	Mean	# of participants		
		Disagree (%)	Neutral (%)	Agree (%)
After the COVID-19 outbreak,				
Q07 I ate while walking less frequently.	4.40	3.72%	12.64%	83.64%
Q08 I paid more attention to hygiene practices of waiters and the environment of the restaurant I visit.	4.22	5.20%	17.47%	77.32%
Q09 I avoided talking while eating.	3.82	11.15%	27.51%	61.34%
Q10 I always wash my hands before eating.	4.25	5.95%	15.61%	78.44%
Q11 I avoided touching food with my hands.	4.04	7.43%	24.16%	68.40%
Q12 I am less likely to share food with my friends and classmates	3.81	11.90%	23.79%	64.31%
Total	4.09	7.56%	20.20%	72.24%

Note: Responses that were less than 3 in the second part of the questionnaire fall into the *Disagree* category, whereas those that were greater than 3 are in the *Agree* category. *Neutral* indicates that the responses were equal to 3.

4. Conclusion

In conclusion, most adolescents adopted better food hygiene practices, but the degree to which they alter their original dietary habits was not as noteworthy. They developed a greater interest in food health, but their awareness did not reflect in their choices yet. Overall, the influence of the outbreak was more positive than negative. Among the respondents that indicated change in their dietary habits, more reported adopting healthier dietary habits than those who took a negative turn. However, the percentage of respondents who adopted worse dietary habits cannot be overlooked. This phenomenon shows the other side of this outbreak. Although the outbreak led adolescents to become more aware of their health, the long term

‘house confinement’ due to online schooling, may have started a different eating trend towards unhealthy foods.

5. Implications

Adolescence, a transitional phase from childhood to adulthood, is a vital time period for laying the foundation for good health. Eating habits developed during this time period not only affect a teenager’s present health status, but also determine one’s long-lasting health condition in the future. Although the COVID-19 outbreak has been a difficult period, it is also an opportunity for adolescents to develop awareness for their health. They may be more willing to make positive changes in their diet because of the connection of a healthy diet with the prevention of and recovery from COVID-19.

As shown in this study, most adolescents developed better food hygiene practices but did not improve their diet after the outbreak. One third of the respondents indicated positive changes in their diet while roughly half of the responses exhibited no changes. This result shows that the importance of healthy eating is still not a widespread knowledge amongst adolescents. Healthy eating promotions are poor in comparison to the frequent broadcasting of COVID-19 prevention measures (wearing masks, keeping social distance, washing hands, etc.) on television or other social platforms. Health authorities should make more use of the “contagious” influence of social media to highlight key and simple steps in developing a healthy diet during the pandemic. Teachers and staff at schools can also contribute by educating students on the measures they can take to develop healthy diets and on the significance of following them.

In addition to promoting eating healthier foods, helping adolescents to reduce the intake of unhealthier food is equally important. As suggested in this study, extended periods staying at home due to online learning can contribute to unhealthy eating habits. There has been an increase in the use of virtual reality (VR) for entertainment and exercise purposes

during the COVID-19 pandemic (CCS Insight, 2021). A growing body of research suggests that VR can be a solution of “escaping” from a lockdown (Siani A & Marley SA, 2021). Future research can investigate whether the use of VR during the lockdown period can effectively reduce unhealthy eating habits.

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