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COVID-19 and the nutrition of children and adolescents

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Abstract

Introduction

During childhood and adolescence, a properly balanced diet is very important, as it has a direct impact on health. During the COVID-19 pandemic, care for the proper diet has become particularly important, especially due to the growing wave of overweight and obesity among children and adolescents, observed especially in adolescence.

Aim

The aim of the study was to determine the impact of the COVID-19 pandemic on the nutrition of children and adolescents.

Material and methods

The research tool was a questionnaire consisting of questions mainly related to the nutrition of children and adolescents. Adolescents are only included if they and their parents or legal guardians have given their informed consent to participate. If they expressed their willingness to participate in the study, the students received an electronic link to the questionnaire.

Results

Most of the respondents were girls / women living in the countryside. The impact of the COVID-19 pandemic on eating behavior was observed in 61% of respondents. Social isolation in 61% of people did not affect the regularity of eating meals. Most of the respondents (54%) did not observe an increase in their appetite during the lockdowns. The number of people consuming 1 and 5 meals has increased, and the number of people consuming 2 and 3 meals a day has decreased.

Conclusions

The time of social isolation associated with the COVID-19 pandemic has affected the nutrition of children and adolescents. The number of people eating 1 and 5 meals during social isolation has increased, and the number of people eating 2 and 3 meals has decreased. During social isolation, a decrease in the physical activity of children and adolescents was observed.

Keywords: dietary habits; children; youth; COVID-19; dietary habits, health behaviour

Wpływ pandemii COVID-19 na styl życia studentów PWSZ w Nowym Sączu

Streszczenie

Wprowadzenie

W okresie dzieciństwa i dorastania bardzo ważna jest prawidłowo zbilansowana dieta, która ma bezpośredni wpływ na stan zdrowia. Podczas pandemii COVID-19 troska o właściwą dietę nabrała szczególnego znaczenia, zwłaszcza z uwagi na narastającą falę nadwagi i otyłości wśród dzieci i młodzieży obserwowaną szczególnie w okresie adolescencji.

Cel

Celem pracy było określenie wpływu pandemii COVID-19 na żywienie dzieci i młodzieży.

Materiał i metody

Narzędzie badawcze stanowił kwestionariusz ankiety składający się z pytań dotyczących głównie zagadnień związanych ze sposobem odżywiania dzieci i młodzieży. Młodzież została uwzględniona tylko wtedy, gdy oni oraz ich rodzice lub opiekunowie prawni wyrazili świadomą zgodę na uczestnictwo. W przypadku wyrażenia chęci udziału w badaniu, uczniowie otrzymali elektroniczny link do kwestionariusza.

Wyniki

Wśród ankietowanych, dominowały dziewczynki/ kobiety zamieszkujące na wsi. Wpływ pandemii COVID-19 na zachowania żywieniowe obserwowało u siebie 61% ankietowanych. Izolacja społeczna u 61% osób nie wpłynęła na regularność spożywania posiłków. Większość ankietowanych (54%) nie obserwowała u siebie wzrostu łaknienia podczas lockdownów. Wzrosła liczba osób spożywających 1 i 5 posiłków oraz zmniejszyła się liczba osób konsumujących 2 i 3 posiłki dziennie.

Wnioski

Czas izolacji społecznej związany z pandemią COVID-19 wpłynął na żywienie dzieci i młodzieży. Wzrosła liczba osób spożywających 1 i 5 posiłków podczas izolacji społecznej, a zmniejszyła się liczba osób spożywających 2 i 3 posiłki. Podczas izolacji społecznej obserwowano spadek aktywności fizycznej dzieci i młodzieży.

Słowa kluczowe: zachowania żywieniowe; dzieci; młodzież; pandemia COVID-19; nawyki żywieniowe, zachowania zdrowotne

Introduction

As of 2020, the COVID-19 pandemic is a major global issue affecting the lifestyle behavior of people around the world. Since its announcement, the rapid global spread of the disease has led to a series of measures that have resulted in more than 2.6 billion people being confined to their homes and socially isolated (www.weforum.org). It has led to unprecedented and often rapid changes in human behavior (Khan and Moverley-Smith, 2020). Due to the high contagion rate of SARS-CoV-2 and its rapid diffusion, many restrictions on human activities and physical interactions have been imposed around the world to prevent the spread of the virus, forcing people to stay at home, affecting their eating habits and lifestyle with potentially negative health consequences (Galluccio et al. 2021). One of the first decisions taken by states and local governments was to announce the closure of schools and universities. In the case of teenagers, physical activity is closely related to school activities, mainly through physical education or additional sports activities. Lockdowns also affected the closure of gyms, fitness centers and other sports and recreation facilities. As a result, during the pandemic, children and adolescents tended to be less physically active, which is fundamental to maintaining mental and physical health. They led a more sedentary lifestyle compared to the school days they used to have (Dunton et al. 2020, Scapaticci et al. 2022). Changing eating habits, combined with a reduction in physical activity, contribute to an increased risk of obesity in children and adolescents, as underlined by the newly coined term 'covibesity'. It was introduced to illustrate the deterioration in obesity rates due to the lockdown imposed during the COVID-19 pandemic (Khan and Moverley-Smith, 2020). The World Health Organization estimates that over two billion adults are overweight and 650 million are obese (WHO, 2021). Lockdown-related weight gain could push those statistics even further. Keep in mind that even a small amount of weight gain in the short term can have profound health consequences with long-term effects. Metabolic changes may have lasting implications, increasing the incidence of diabetes and cardiovascular disease (Jin and Ma, 2021; Mikulec et al. 2022Remote work and learning as well as more frequent use of social media have resulted in an increase in the time spent in front of a computer or phone screen (Nagata et al. 2020).

Study aim

The aim of the study was to determine the impact of the COVID-19 pandemic on the health and nutritional behavior of school children and youth from the Małopolskie Voivodeship.

Material and methods

The research tool was a questionnaire. The survey was conducted online via the Google Forms online survey platform. The research was conducted in the period from September to October, 2022, on a group of on a group of 265 children and adolescents, students of primary and secondary schools in the Małopolskie Voivodeship.

The questions included in the questionnaire concerned issues related among others to eating behavior, the regularity of meals consumed, the frequency of consumption of specific groups of products, supplementation, and physical activity. The first part of the questionnaire was a record concerning, inter alia, socio-demographic data of the surveyed students. It included questions about age, sex and place of residence.

All study participants gave informed consent. Adolescents are only included if they and their parents or legal guardians have given their informed consent to participate. If they expressed their willingness to participate in the study, the students received an electronic link to the questionnaire.

Chi square test was employed to assess the association between categorical variables. Results were significant for p value < 0.05. Statistical analysis was performed using Statistica 13.0 (StatSoft, Poland).

Results

The study group was dominated by girls and women aged 16-18, living in rural areas (Table 1).

Table 1. Demographic characteristics of the study participants

Parameter	Girls/ women [number of people]	Boys/ men [number of people]
Gender	188	77
Age [number of people]		
Years		
7-9	4	6
10-12	4	4
13-15	34	13
16-18	146	54
Place of residence [number of people]		
City	42	24
Countryside	146	53

There were no significant changes in body weight between boys and girls during the pandemic (p=0.26). Among the respondents, 55% of boys and 53% of girls did not observe changes in body weight during the pandemic. Weight gain was declared by 35% of boys and 30% of girls, and weight loss by 10% and 18%, respectively (Fig. 1).

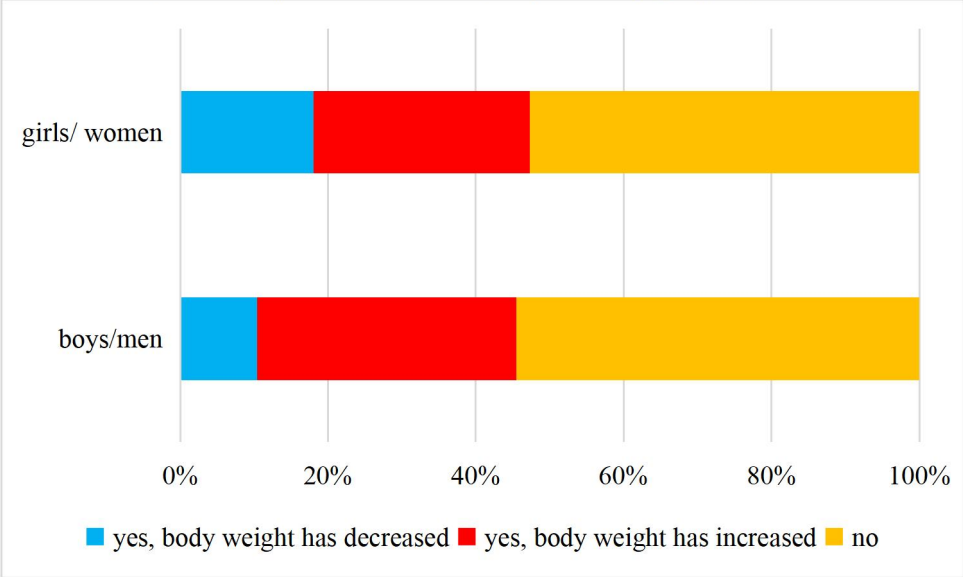

Figure 1. Weight change during a pandemic

The group of men, before the pandemic, was dominated by people practicing spontaneous (occasional) physical activity understood as physical activity not related to training (32.5%) and 1-2 times a week (16.9%), while lack of physical activity was declared by 10.4% (Fig. 2). During the pandemic by 5 percentage points (p.p.) the number of people engaged in spontaneous physical activity decreased by 7 p.p. practicing sports 1-2 times a week. at 6 p.p. the number of boys practicing sports several times a month increased and by 6.5 p.p. number of people who do not practice physical activity (Fig. 2). The duration of physical activity before the pandemic was 1-2 hours for 34% of the respondents, 15-30 minutes for 26% and 20% 30-45 minutes. During the pandemic, a decrease in physical activity was observed. The number of people devoting less than 15 minutes a day to activity increased by 11 p.p., and by 9 p.p. the number of people practicing sport for 1-2 hours decreased, only the number of people declaring activity for 15-30 minutes a day did not change (Fig. 3). Before the pandemic, girls were dominated by people practicing spontaneous physical activity 27%), 1-2 times a month (18%) and several times a month (17.5%) (Fig. 2). There was a significant difference in the activity of boys and girls during the pandemic (p = 0.04). During the

pandemic, the number of people not practicing physical activity almost quadrupled from 6.9 to 23.5% (Fig. 2). Before the pandemic, girls practicing sports for 30-45 minutes a day (62%) and 15-30 minutes (47%) dominated in the study group. During the lockdowns, the number of people practicing sports for 30-45 minutes per day decreased by 15 p.p., and by 8 percentage points for 1-2 hours per day. After 10 p.p. an increase in the number of people declaring no physical activity and less than 15 minutes a day. The only increase, by 7 p.p., was observed in the group practicing sport for 15-30 minutes a day (Fig. 3).

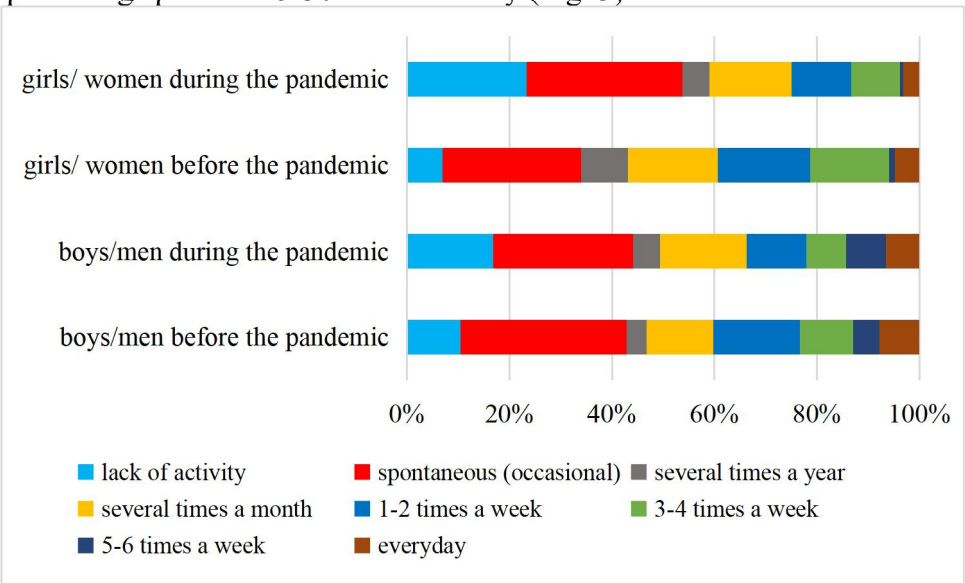

Figure 2. Physical activity before and during the pandemic

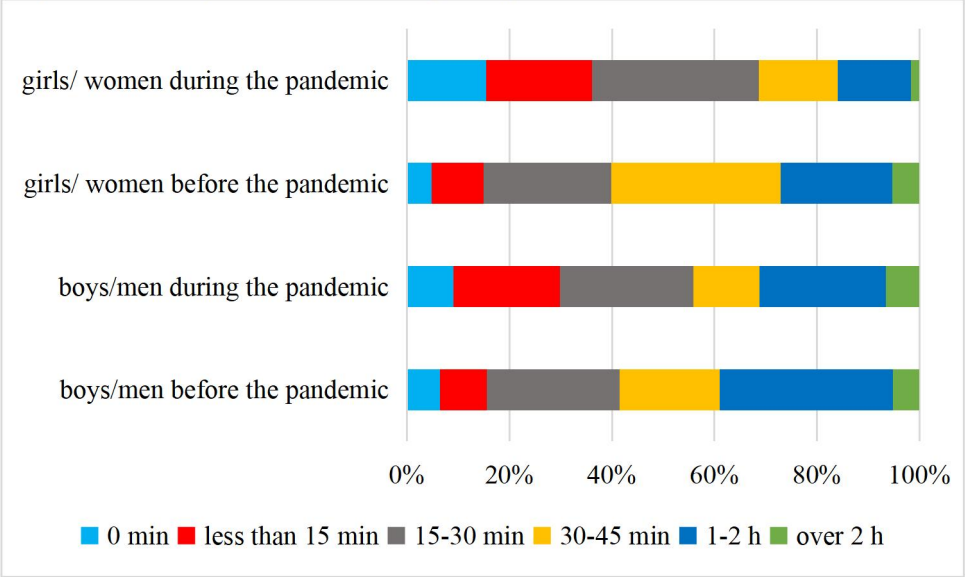

Figure 3. Average duration of physical activity

There were no significant differences in the number of meals consumed before and during the pandemic between boys and girls (p=0.26). Before the pandemic, both groups were dominated by people eating 3 meals (50% of boys and 45% of girls), while during the pandemic, people eating 3 and 4 meals dominated among all studies, 36% for men and 32% and 35% for women, respectively (Fig. 4).

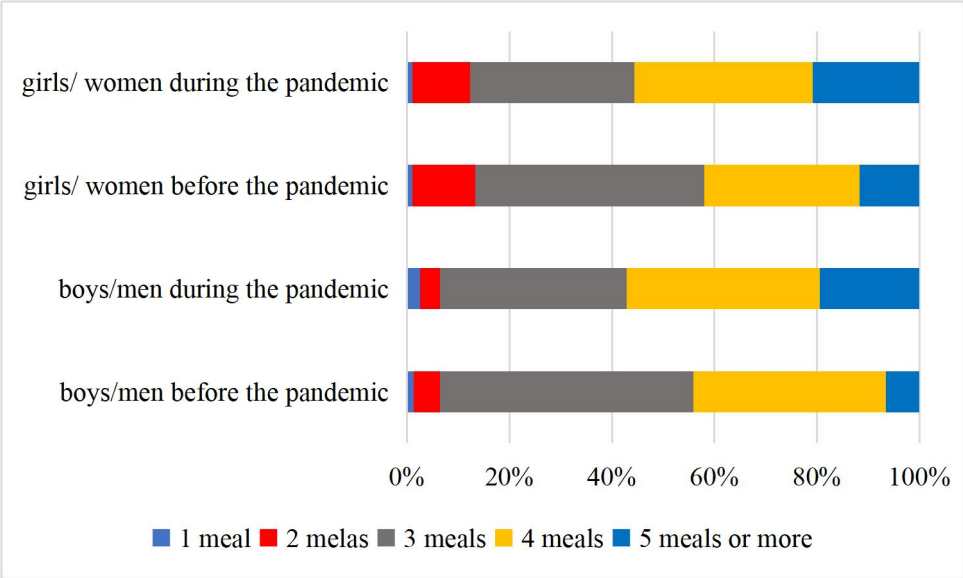

Figure 4. Daily number of meals

There was a significant difference in the regularity of eating meals during the pandemic between women and men (p=0.01). Among women, 66% and 48% declared that they did not eat meals regularly during the pandemic. Only 34% of men and 25% of women ate meals at regular times (Fig. 5).

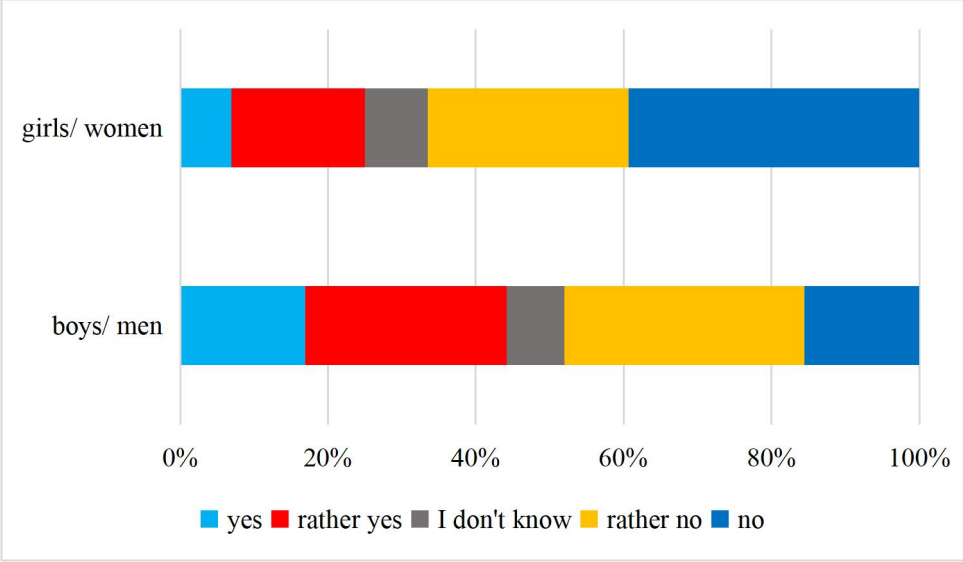

Figure 5. Regularity of eating meals during a pandemic

There was no significant difference in the frequency of snacking among men and women (p=0.86). On average, 30% of people in both groups declared snacking every day, several times a week, and rarely. 2% of women and 3.5% of men never snacked (Fig. 6).

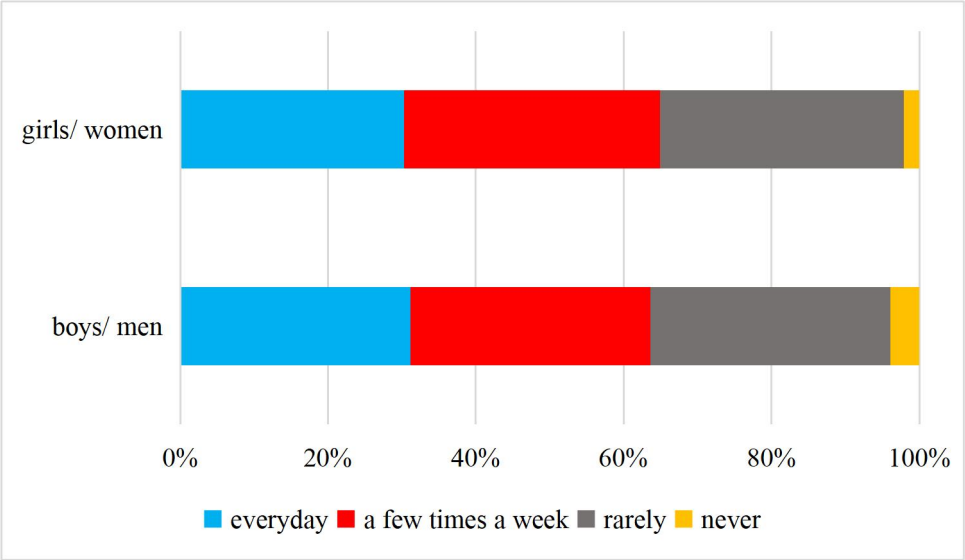

Figure 6. Frequency of snacking during a pandemic

There were no significant differences in the increase in appetite in the observed groups (p=0.29). Only 13% of men and 23% of women observed an increase in appetite during social isolation (Fig. 7).

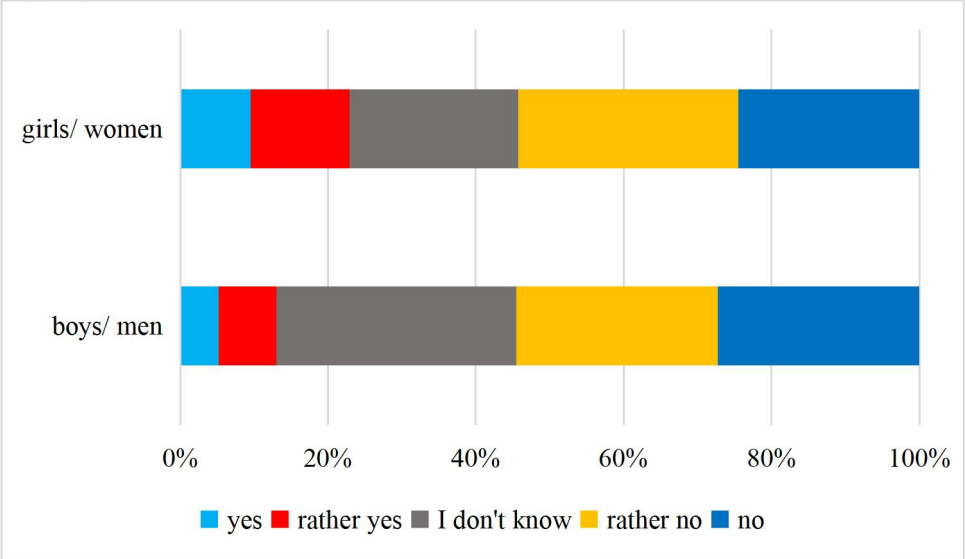

Figure 7. An increase in appetite during a pandemic

Discussion

In recent years, the importance of proper nutrition and properly selected physical activity for human health has been emphasized. At the same time, unfavorable trends are observed in the basic health parameters of children and adolescents. Every year, there are more and more teenagers diagnosed with obesity, which is the result of an unhealthy lifestyle (WHO, 2021). More and more often, the model of spending free time in front of a TV or computer screen, combined with irregular consumption of improperly balanced meals, dominates. Adolescence is one of the most important stages determining the future psycho-physical potential of a person. This period of life is characterized by a high demand for energy and building components, which results, among others, from the acceleration of growth, and thus intensive bone building, muscle mass and development of the entire system. It is therefore extremely important to combine rational nutrition - preventing nutritional deficiencies with regular, systematic and varied physical exercise (UNICEF, 2022). In adolescence, eating habits are definitely formed, and the way of eating is largely based on the young person's independent choices. This is associated with the risk of high susceptibility of a teenager to the often

negative influence of various external factors, such as a peer group, social media, advertising or current fashion. Rapid weight gain in children is quite often associated with obesity later in life, which can have lasting health repercussions (Salgin et al. 2015). There is a strong connection between the immune system and nutrition. Adequate nutrient intake is essential to ensure energy and nutrient supplies for the maintenance and replication of immune system cells. At the same time, the detrimental effect of malnutrition on determining resistance to infection is also known (Bhaskaram , 2001; Calder, 2020).

In the study group, the percentage of children and adolescents declaring weight gain during social isolation was lower than in the studies of authors from other countries. Allabadi et al. (2020) observed 41.7% of Palestinian teenagers gain weight due to increased consumption of fried foods, sweets, sugary drinks, and dairy products. Yang et al. (2020) observed an increase in the BMI of both school and university students in China. In Poland, an increase in BMI was observed in 30% of adult Poles, which was associated with a decrease in the consumption of vegetables, fruits and legumes (Sidor i Rzymski, 2020). Zborowski and Mikulec (2021) did not observe significant changes in body weight of students of the PWSZ in Nowy Sącz after almost a year and a half of the pandemic.

The results obtained by us can be explained by the demographic structure as well as the place of residence of the respondents. The study group was dominated by young women who attach great importance to their appearance and control their body weight. Among the respondents, people living in rural areas dominated, for whom the time of social isolation certainly turned out to be less severe. Living in the city is associated with limitations, such as: a small number of places for walking, running or recreational cycling, or reduced contact with nature. In addition, temporary restrictions concerned the closure of gyms, fitness clubs, sports facilities, the ban on going to parks and even forests, which was a severe nuisance for city dwellers.

Restrictions on social contacts, which also limited participation in outdoor activities, have contributed to the disruption of the daily routine of millions of children and young people, making it difficult for them to engage in regular physical activity and exercise (Bates et al. 2020). The obtained results are consistent with those obtained by other authors. Moore et al. (2020) observed the side effects of the COVID-19 outbreak in Canadian children and adolescents. Only 3.6% of children (5-11 years old) and only 2.6% of teenagers (12-17 years old) did moderate physical activity (PA) 60 minutes a day during the COVID-19 pandemic. Xiang et al. (2020) in a study of 2,426 children and teenagers (aged 6-17) in five schools in Shanghai, observed a drastic decrease in the median time spent in PA from 540 min/week (pre-pandemic) to 105 min/week (during the pandemic) . And the prevalence of physically inactive students increased from 21.3% to 65.6%. Laddu et al. (2021) emphasize that each moderate-intensity PA session promotes the antipathogenic activity of macrophages stimulating the recirculation of immune system cells, immunoglobins and anti-inflammatory cytokines in the blood. In this way, PA can reduce the influx of inflammatory cells in the lungs, counteracting the pathogen load and alleviating the symptomatology of infectious diseases.

The restrictions introduced during successive lockdowns also determined changes in eating habits that disrupted the maintenance of a healthy and balanced diet. As a consequence, during the COVID-19 pandemic, a higher rate of obesity and nutritional deficiencies has been documented (Fore et al. 2020). Changes in dietary patterns during the pandemic have also resulted from the financial difficulties associated with COVID-19, which has forced large numbers of families to ration food and make cheaper and unhealthy food choices (Dunn et al. 2020).

Pietrobelli et al. (2020) observed an increase in the number of meals consumed more often among men than women, which was also noticeable in their own research. Ruiz-Roso et al. (2020) and Di Renzo et al. (2020) observed an increase in teen consumption of fried foods

and sweets to 20.7% during lockdown. And a moderate 24% increase in the consumption of salty snacks in young women. Snacking between meals in own research was observed in 98% of women and 96.5% of men.

Conclusion

The time of social isolation associated with the COVID-19 pandemic has had an impact on lifestyle behavior. An unbalanced diet, leading to an increased risk of both overweight and underweight, a sedentary lifestyle, and lack of physical activity affect their health.

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