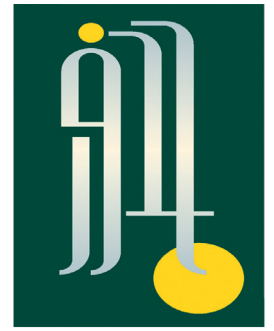




PCAH

Palestinian Coalition For Adolescence Health



JUZOOR






Research Paper

Impact of COVID-19 lockdown on dietary and lifestyle behaviors among adolescents in Palestine



Under the auspices of the Palestinian Coalition for Adolescence Health, this research paper was conducted by Juzoor for Health and Social Development to study the negative effects of COVID-19 and the lockdown on the dietary and lifestyle habits of Palestinian adolescents. This research paper also provides conclusions, recommendations and needed actions.

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SIGNIFICANCE OF STUDY

What is already known about this subject?

There are alarming rates of children and adolescent obesity and overweight in Palestine [1]. It is well-recognized adolescent populations are likely to gain more weight during summer vacations than during the school year [2]. This may indicate that the COVID-19 lockdown will lead to negative changes in dietary and lifestyle behaviors among this population, which have been in home confinement since the school closures.

What are the new findings?

This study found unfavorable changes in risk factors for weight gain including over-eating, diet and nutrition, physical activity, sleep, and screen time behaviors among adolescents during the COVID-19 lockdown. This raises major concerns for the health and well-being of Palestinian adolescents amidst the current confinement conditions and other potential closures or lockdowns in the future.

How might these results change the direction of clinical practice and policy-making?

Recognizing these adverse effects of the COVID-19 pandemic lockdown is critical for adolescents at risk or struggling with obesity or overweight. Lockdown conditions and home confinement appear to create an unfavorable environment for children and adolescents to maintain healthy lifestyle behaviors such as healthy eating and physical activity. The observations found in this study point to the critical need for the implementation of preventative measures for obesity and overweight during lockdown periods and national-closures. Policy makers should consider the deleterious lifestyle effects of the lockdown on youth at risk and with obesity when making decisions regarding the current lockdown and related future crises.

STUDY BACKGROUND

As the coronavirus (COVID-19) pandemic is still ongoing, it has created a profound impact socially, physically and economically on families across the globe. With confinement laws and regulations still being enforced, health care systems are deteriorating, economies are shutting down and school closings are being extended. These restrictions are leading to severe repercussions on individuals' daily routines and lifestyle behaviors including food access and utilization, outdoor activities, travel, school-related functions, and access to many forms of leisure and exercise [3]. Particularly alarming are the implications of the lockdown on irregular eating habits, excessive snacking and lack of physical activity, all of which are associated with high-calorie intake and increased risk of obesity [4]. Similarly, home confinement leads to an increase in sedentary behaviors that lead to low levels of energy and mainly activities involving an excessive amount of sitting [5]. These changes in dietary and lifestyle-related habits during the COVID-19 outbreak could be associated with feelings of fear, anxiety, and stress, which many people may be experiencing around the world [6].

Under the current restrictive measures and the prolonging of school closures indefinitely, there is a pressing need to call attention to the pandemic's longer-term effect on children and adolescent health and well-being. It is well recognized that when children are out of school (e.g. weekends and summer holidays), they are physically less active, more sedentary, irregular sleep patterns, and less favourable diets, all of which result in weight gain [7]. Such negative effects on health are likely to be much worse when children are confined to their homes without outdoor activities and school-related excursions [2].

In the context of Palestine, the longstanding Israeli-Palestinian conflict has led to major barriers including restrictions to movement, lack of control on borders including import/export processes, lack of control on natural resources including water, limited resources and access to healthcare, and a compromised economy with high unemployment. The current COVID-19 crisis and the imposed countrywide lockdown exacerbates the difficult living situation and exposes the Palestinians to further vulnerabilities and stress. It is assumed, families living in the most marginalized areas of Palestine and those already recognized as vulnerable populations are likely to be the most impacted amidst this crisis.

As school closures are extended in Palestine, it is no surprise that the COVID-19 crisis and lockdown could potentially be affecting children's and adolescent's dietary and lifestyle habits. While being forced to stay at home, these population groups are at risk of weight gain due to overeating, consuming unhealthy foods, physical inactivity because of movement restrictions and minimal stimulation, all of which are associated with high-calorie intake and increased risk of obesity. This is extremely alarming as Palestine is already increasingly affected by the double burden of malnutrition: the persistence of under-nutrition, combined with a rapid rise in overweight and obesity [8]. In a recent report in 2014, the prevalence of overweight and obesity among Palestinian school children was **18.6%** and **7.24%**, respectively. The prevalence of stunting found in the same study was **7%** [9]. In general, children start school with moderate stunting and underweight, however, by high school, overweight start to become observed, particularly among girls [1].

The increasing problem with childhood undernutrition and obesity requires particular attention. If unattended to, it becomes problematic as children and adolescents who are overweight and obese are likely to be obese in adulthood and more likely to acquire non-communicable diseases (NCDs) at a younger age [10]. With school closures imposed indefinitely, this may exacerbate the epidemic of childhood obesity and increase disparities in obesity risk.

Under the emergency lockdown situation, it is likely that nutrition and obesity are not priority policy issues due to mounting problems and needs in all realms. However, and despite the overwhelming issues, which require attention, it is critical to tackle children's and adolescents lifestyle behaviors with the added challenges of COVID-19.

To date, there is little evidence to evaluate the effect of home confinement on lifestyle behaviors among children and adolescents and particularly if, as a result of the lockdown, children and adolescents are spending less time being physically active, going to bed later, and sleeping in later because of school closures, or spending more time sedentary, with increased screen time.

It is crucial to investigate how individual behavior changes over time under lockdown conditions and how such crises such as the COVID-19 pandemic, may directly impact behavior and health status of populations, particularly children and adolescents. Similarly, with child and adolescent obesity on the rise in Palestine, the situation could be worsened by the current challenges of the pandemic and its negative effects on dietary and lifestyle habits of Palestinian children and adolescents.

Juzoor for Health and Social Development mandate's with child and adolescent obesity have led to the conduct of this study, given that the situation could be worsened by the current circumstances and the aftermath of COVID-19. This briefing presents preliminary findings to rapidly inform policy-makers and stakeholders on the impact of the COVID-19 crisis on changes in dietary and lifestyle-related behaviors among Palestinian adolescents, in hopes to promote interventions to support engagement in healthy-eating and lifestyle habits of individuals, while under the current lockdown conditions and future pandemic responses and crises in Palestine. In addition, the results can potentially inform stakeholders of vulnerable populations who are at risk of obesity or malnutrition, and provide assistance for them. Longer-term, the findings will enable Juzoor and partners to demonstrate associations between changed social and cultural conditions and individual-level behavior amidst such a crisis. In addition, the study will help stakeholders to understand how individual behavior changes over time under lockdown conditions and how such crises, may directly impact behavior and health status of populations. Our findings will inform public health policies, and, in particular, will contribute to policy planning for future pandemic crises in regards to dietary and lifestyle behaviors.

STUDY OBJECTIVES

Juzoor, in collaboration with the Jerusalem Media and Communications Centre conducted this study to assess major changes in dietary and lifestyle behaviors of adolescents in the West Bank during the country-wide lockdown to help address important issues about the overall impact of confinement measures on their health. **Specific objectives are to examine:**

1. The impact of the COVID-19 lockdown on changes in weight, and dietary and nutrition behaviors
2. The impact of the COVID-19 lockdown on changes in lifestyle behaviors including physical activity, screen time, and sleep patterns
3. The association between changes in weight and food intake, physical inactivity, screen time, sleep patterns and sources of stress during the lockdown
4. Gender differences in weight, dietary and nutrition behaviors, physical activity, screen time and sleep patterns

STUDY METHODOLOGY

The Study Design

The study was conducted on a sample of **600** adolescents residing in all governorates in the West Bank, Palestine during the period between April 24 and April 27, 2020. Participants were eligible if they were between **10** and **19** years of age. Subjects who consented to participate in the study were interviewed by telephone by trained researchers using a structured questionnaire, developed by the authors of the study. Phone interviews lasted between **10-15** minutes. In total, **65.7%** of the sample was chosen using randomly generated phone numbers and **34.3%** were chosen using the snowball technique. One adolescent participant was randomly selected from each household using the Kish selection grid, a method for selecting members within a household to be interviewed. Verbal informed consent was obtained from parents/legal guardians of all eligible participants after explanation of the study including objectives, confidentiality and benefits of the study. The study protocol was reviewed and approved by the Helsinki Ethics Committee of the Palestinian Health Research Council in the Gaza Strip.

The Sample Size

The sample size was estimated based on a confidence level (**95%**), confidence interval (4) and population size of adolescents living in the West Bank including East Jerusalem, in which adolescents represent **37%** of the total youth population (**1.4 million**) in Palestine [11].

The Study Assessments and Measures

The questionnaire assessed a range of lifestyle behaviors including dietary habits, physical activity, screen time, sleep patterns, socio-demographic factors, and sources of stress during the lockdown. All questions were structured to be answered directly in comparison to “before” or “during” confinement conditions. The questionnaire was translated from English to Arabic and back-translated from Arabic to English by bilingual experts.

Socio-demographic factors

Sex, age, social status, education, occupation, residence, household size and family's financial situation.

Dietary habits

Increase/decrease weight, Increase/decrease in frequency of food intake, and increase/decrease in dietary intake (sugar-added drinks, vegetables, fruits, dairy products, canned foods, fried foods, sweets and sugars).

Physical activity

Days of exercise per week; increase/decrease in physical activity.

Screen time

Increase/decrease in screen time watching television and using computers/tablet/mobiles; hours spent on the television per day; hours spent on computers/tablet/mobiles per day; hours spent on the screen for school-related functions.

Sleep patterns

Hours of sleep per day; increase/decrease in hours of sleep

Sources of stress

Participants were asked if the following factors were causing stress in their daily lives during the lockdown: staying at home all day, distance learning, housework, not going to work, current financial situation, distance from family members, distance from friends, and family relationships.

MAIN FINDINGS

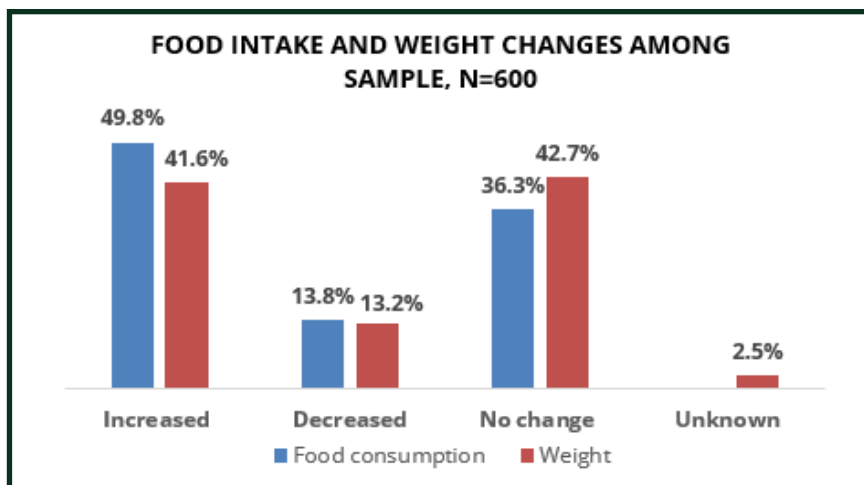
I. Socio-demographic factors

Among the sample, **50.0%** were males and **50%** were females. The average age of the participants was **14** (range **10-19** years). The majority of the participants were not married (**99.8%**), lived in cities (**71.5%**), and were students (**96.2%**), with approximately **80.0%** in primary or middle school. The average household size of participants was six. Approximately **343 (57.0%)** of the sample reported their family's financial situation became worse during the lockdown in comparison to before the beginning of the confinement period. Among all West Bank governorates, the majority of the study sample resided in Hebron (**28%**), Ramallah (**13%**), Nablus (**15%**), and Jenin (**12%**).

II. Dietary and nutrition behaviors among adolescents in comparison to before the lockdown

Food intake and weight change

Among the total sample, approximately **299 (50.0%)** of adolescents reported that their food intake increased compared to before the lockdown. Two-hundred and fifty (**41.7%**) reported that they gained weight in comparison to before the lockdown, while **256 (42.7%)** reported no change in their weight. Three-hundred and ten (**51.7%**) of the adolescents reported eating three meals per day, while **90 (15%)** reported consuming four meals a day during the lockdown. In addition, **322 (53.4%)** reported eating meals after 9:00 pm during the lockdown.



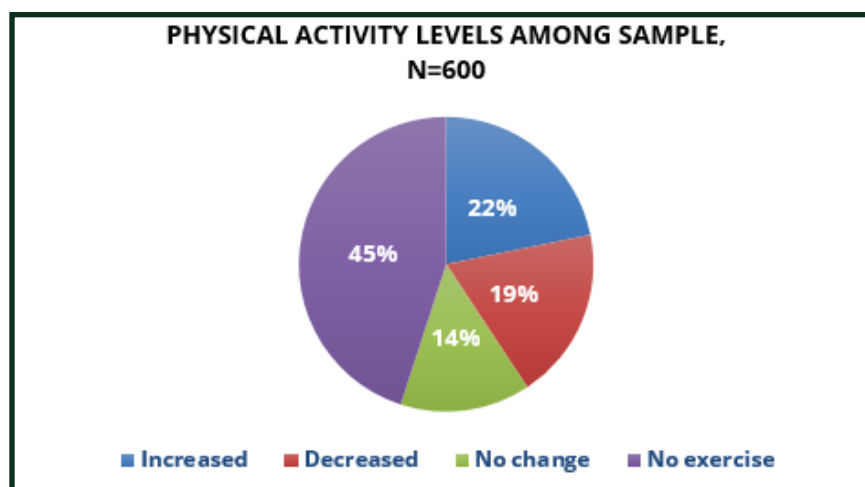
Dietary intake, by food groups

Participants reported whether their food intake based on different food groups increased or decreased in comparison to before the lockdown. One-hundred and eighty nine (**31.5%**) reported an increase in sugar-added drinks (soda, processed juice etc.); **237 (39.5%)** reported an increase in vegetable intake, while **199 (33.2%)** reported an increase in fruit intake. Two-hundred and fifteen (**35.8%**) and **184 (30.7%)** of participants reported no changes in their intake of dairy products and canned foods, respectively. Additionally, **220 (36.7%)** reported an increase in their intake of fried foods, while **279 (46.5%)** reported an increase in sweets and sugar-added food in comparison to before the lockdown.

III.

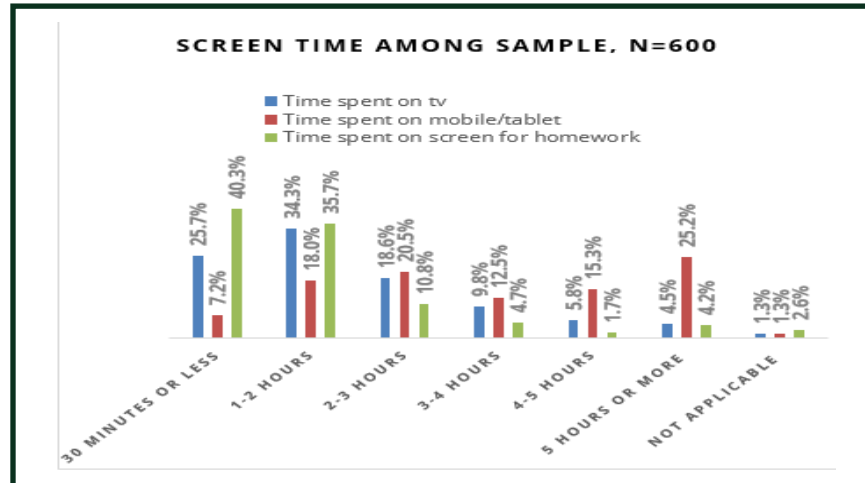
Physical activity levels among sample during the lockdown

Two-Hundred and seventy (**45.0%**) adolescents reported no physical activity (e.g. walking, running, home exercises) in general during the lockdown, while **29.5%** reported exercising one to three times per week and **25.5%**. Among those reporting some sort of exercise, **131 (21.8%)** reported an increase, while **113 (18.8%)** reported a decrease in their physical activity. Moreover, **277 (46.2%)** reported doing more housework and gardening in comparison to before the lockdown.



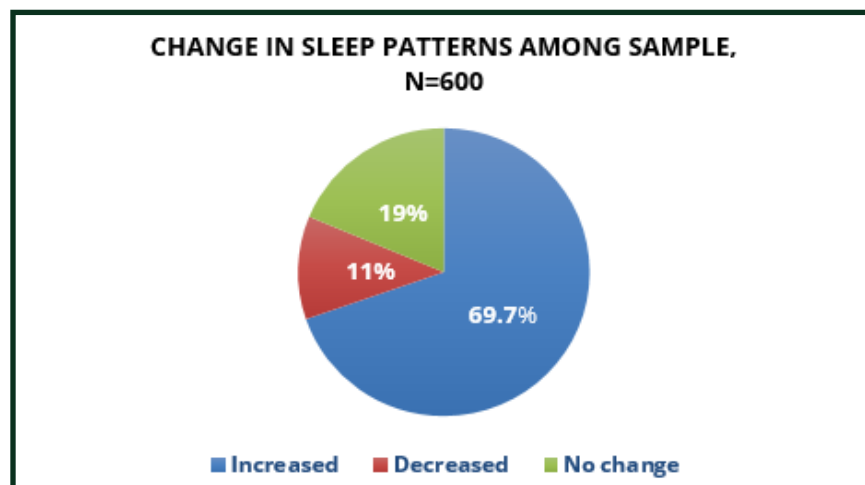
IV. Screen time among sample during the lockdown

Four-hundred and forty-eight (**74.7%**) reported they were spending more time watching television and using computers/tablet/mobiles during the lockdown compared to before: the majority (**78.5%**), reported watching television between one to three hours per day during the lockdown, while **53.0%** reported spending four or more hours on the computer/mobile/tablet during the lockdown and **242 (40.3%)** reported they were spending time on the screen for school-related functions.



V. Screen time among sample during the lockdown

The average hours of sleep per day during the lockdown was nine. Four-hundred and eighteen (**69.7%**) reported sleeping more during the lockdown compared to before the lockdown. Similarly, **415 (69.2%)** reported their sleep quality during the lockdown as good. Only **79 (13.2%)** reported poor quality of sleep during the lockdown.



VI.

Relationship between weight change and food intake, types of food consumed, physical activity, sleep patterns, screen time, and other factors among the sample (bivariate analyses)

Findings revealed among those who reported increased weight compared to before the lockdown, were those with reported increased food intake ($p<0.001$); those who reported more cooking ($p<0.001$); those who consumed more sugar-added drinks ($p<0.001$); fried foods ($p=0.07$), sweets ($p<0.001$); those who ate meals after 9:00pm ($p=0.006$); those who reported no physical activity during the lockdown ($p=0.05$); and those which reported increased screen time during the lockdown ($p=0.001$).

Additionally, those who reported an increase in their weight, also reported their family financial situation became worst during the lockdown ($p<0.001$).

Among those who reported increased weight also were those who reported an increase in their sleep patterns and were in primary school; however, these associations were not significant. No significant association was found for weight change and age.

VII.

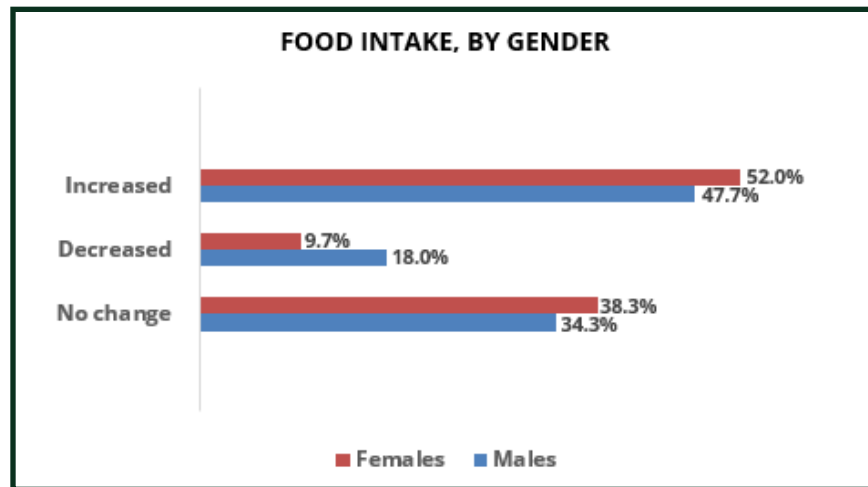
Factors associated with weight change among the sample (multinomial logistic regression analyses)

According to an in-depth analysis, the increase in food intake during the lockdown was independently associated with increased weight ($p<0.001$). However, there was no independent association found for the relationship between increased weight and physical inactivity, increased hours of sleep nor increased screen time. In contrast, increased weight was associated with increased intake of dairy products ($p=0.005$), however it was not associated with any other food group. Increased intake of vegetables, was associated with decreased weight ($p=0.056$). Among the socio-demographic factors, it was found that participants' family financial situation was independently associated with increased weight ($p=0.057$). No other factors such as sex, age, residence, years of education were independently associated with change in weight in the regression analyses.

VIII.

Gender differences among sample**Food intake and weight change during the lockdown**

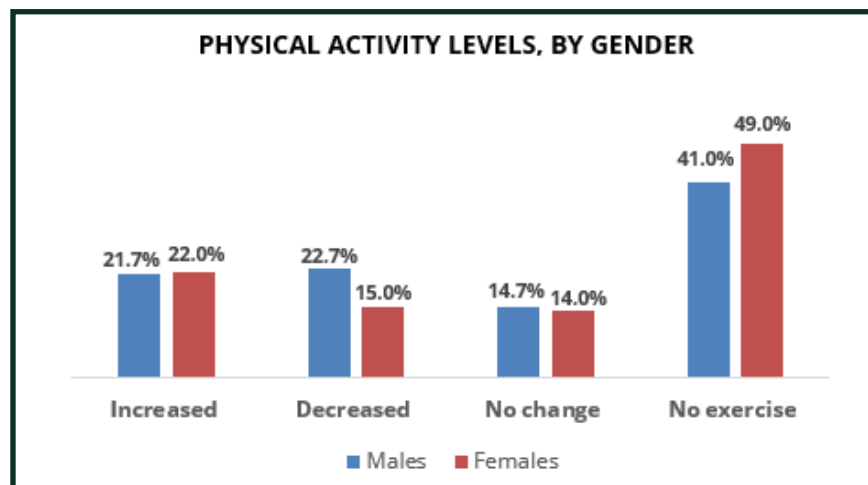
In general, food intake compared to before the lockdown increased significantly more in females than in males ($p=0.013$). However, there were no significant differences in weight change between females and males.



In regards to intake of the different food groups, males were found to consume sugar-added drinks more than before the lockdown compared to females; and females were found to consume fried foods more than before the lockdown compared to males; no differences were found among males and females in consumption of sweets compared to before the lockdown. Although no significant gender differences were found, more males reported eating four or more meals a day compared to females.

Physical activity levels during the lockdown

Findings revealed females were more likely to be physically inactive than males, in comparison to before the lockdown. In contrast, a decline in physical activity levels was reported more among males than females during the lockdown.



Sleep patterns during the lockdown

In general, both females and males reported sleeping on average nine hours a day during the lockdown. Among the total sample, females reported sleeping more during the lockdown compared to males (**73.0%** vs. **66.3%**), however this association was not found significant.

Screen time during the lockdown

In general, males were more likely to spend five or more hours on their mobile/tablet during the lockdown than females, however there were no significant gender differences found for changes in screen time during the lockdown in comparison to before the lockdown.

IX. Association of family's financial situation with nutrition and weight changes

Adolescents, which reported their family's financial situation became worst during the lockdown, also reported increased food intake and weight ($p < 0.001$), an increase in sugar-added drinks; increased intake of canned food ($p = 0.013$); increased intake of sweets ($p = 0.005$) and either reported an increase or no change in intake of dairy products ($p = 0.03$) compared to before the lockdown. Similarly, among the same proportion of the sample, it was reported that there was an increased intake of fried food, however, this association was not significant. There was no association for the relationship of the family's financial situation with food intake or weight and household size.

X. Diet and nutrition behaviors by type of residence and governorate

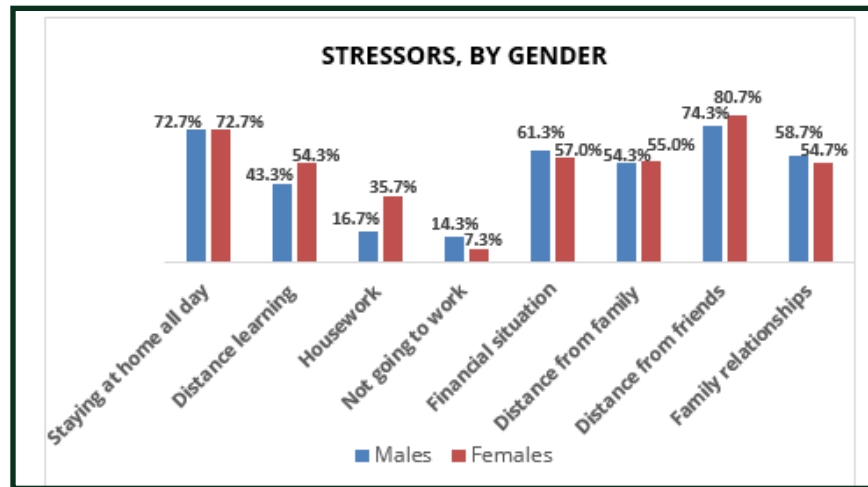
There were no significant associations found for the relationship between the type of residence (e.g. city, village, camp), food intake and weight change during the lockdown. Additionally, there was no association found between the place of residence and financial situation. In contrast, it was revealed adolescents living in camps more frequently reported increased intake of canned foods and fried foods during the lockdown compared to those living in cities and villages.

XI. Main stressors among sample during the lockdown

The most common stressors reported by both males and females were staying at home **436 (72.7%)**, being away from friends **465 (77.5%)**, financial situation **355 (59.2%)**, and family relationships **340 (56.7%)**.

Females were more likely to report housework ($p < 0.001$) and distance learning ($p = 0.004$) as being major stressors during the lockdown compared to males. No other major gender differences were reported in regards to stressors during the lockdown.

Among all stressors, findings revealed, staying at home, distance learning, not going to work, financial situation, distance from family and friends and family relationships at home were significantly associated with increased weight and significantly associated with increased food intake during the lockdown.



CONCLUSIONS

- ▶ In general, the majority of adolescents' nutritional and lifestyle behaviors were negatively affected during the lockdown.
- ▶ Approximately 50% of the sample reported an increase in their food intake, while 41% reported they gained weight during the lockdown.
- ▶ Fifty percent reported no physical activity during the lockdown, while 75% reported an increase in time spent on the screen.
- ▶ In general, there was an increase in intake of non-nutritional foods (e.g. sugar-added drinks, canned and fried foods and sweets).
- ▶ The COVID-19 lockdown has negatively impacted the financial situation of many Palestinian families. Poor family financial situations as a result of the lockdown led to the increased intake of poor micronutrient foods such as fried food, canned foods, sweets and sugar-added drinks as well as increased weight.
- ▶ It should be noted that those living in camps, reported increased consumption of canned and fried foods during the lockdown compared to before, and in comparison to those living in cities and camps.
- ▶ Among those who reported increased weight compared to before the lockdown, were those with increased food intake, increased intake of sugar-added drinks, fried foods and sweets, those who reported no physical activity during the lockdown and those which reported increased screen time during the lockdown.

- ▶ No gender differences were observed for change in weight during the lockdown, however females reported increased food intake more frequently than males.
- ▶ Females were more likely to be physically inactive than males.
- ▶ No major gender differences observed for sleep and screen time.
- ▶ Stressors occurring as a result of the lockdown including being home all day, distance learning, family relationships and distance from family and friends all were associated with increased weight.

RECOMMENDATIONS

- ▶ Develop and use social media messages (e.g. videos, pamphlets, success stories) to promote physical activity in children's, adolescents and youth's daily routines during lockdowns and closures including promoting:
 - Outdoor activities while observing distancing regulations
 - At least 60 minutes daily of activity of moderate intensity
 - Virtual exercises on the internet
 - Taking breaks from sitting
- ▶ Promotion by government of healthy movement behaviors in children as part of response strategies and public messages.
- ▶ Knowledgeable educators promote movement behavior guidelines, and embrace opportunities to incorporate healthy movement messages, practices, and policies into daily home-school routines and lessons.
- ▶ Implement telemedicine nutritional programs for children, adolescents and youth during lockdowns and closures: promote intake of fruits and vegetables, restrict intake of energy-dense, micronutrient-poor foods (e.g. packaged snacks), restrict the intake of sugars-sweetened soft drinks and promote specific meal times during the day.
- ▶ Promote healthy sleep patterns among children, adolescents and youth during lockdowns and closures: 9-11 hours per day of good quality sleep, keeping bedtime and rising time consistent.
- ▶ Promote healthy sedentary behaviors among children, adolescents and youth: Engaging in no more than two hours of screen time a day and keeping screens out of sleeping rooms and avoid screen use before bedtime.

- ▶ Develop a strategic plan to implement nutrition and physical activity interventions and programs in Palestinian schools during the school year and the summer break.
- ▶ Promote physical activity and healthy diets in schools and communities, creating more opportunities for families to interact in promoting healthy lifestyles for their children.
- ▶ Raise awareness to limit television viewing among children and adolescents in schools and families, by providing other active lifestyles and limiting exposure of young children to heavy marketing practices of energy-dense, micro-nutrient-poor foods.
- ▶ Health professionals can provide supplemental guidance encouraging families to maintain healthy lifestyle choices, and facilities can be designed for implementing exercise programs that minimize viral transmission.
- ▶ Despite the overwhelming needs and budget limitations, continue to seek inclusion of related psychological support in ministry budgets.
- ▶ Consistently monitor obesity and nutritional trends from the COVID-19 crisis and beyond with support from relevant stakeholders.
- ▶ Learn from current experiences to inform a process of review of policies and services as needed under crisis in the future.
- ▶ Conduct research and related surveys on COVID-19 and obesity; using results to inform policy makers, service provision and raising awareness.
- ▶ Continue fundraising for services, highlighting importance of implications of the current COVID-19 crisis on the need to support services now and in the future.
- ▶ Review Palestinian nutrition and NCDs programs in terms of impact, challenges and lessons learned.
- ▶ Provide Palestinian institutions and professionals with the latest scientific evidence-based findings regarding nutrition and NCD-related programs.
- ▶ Advocate to end occupation and raise awareness of Palestinians' basic human rights, including access to food.

NEEDED ACTIONS

There is broad consensus among health professionals and academics about the care required during and after pandemics or other crises. The physical and mental impact due to lifestyle changes under crises-related lockdowns may have far-reaching effects burdening services in the future including those resulting from changes in eating and lifestyle habits. In the aftermath of the COVID-19 lockdown, stakeholders should work closely with national health policy-makers to:

In terms of services

- ▶ Provide online mental health resources to guide adolescents and their families through the stress and tension they are experiencing during and after the COVID-19 lockdown.
- ▶ Train institutions and non-government organizations (NGOs) on mental and psychological issues under crisis to offer training for those in need.
- ▶ Monitor food supplies in terms of labelling nutritional facts.

In terms of research

- ▶ Conduct research studies and surveys, using results to inform policy makers and service provision and raise awareness.
- ▶ Develop manuals and guides to assist parents, caregivers and teachers in managing tensions, fears and emotions from the lockdown and the gradual adaptation to normal life after the lockdown.

In terms of communication and awareness raising


- ▶ Educate people about the expected psychological impact and reactions to crises and raise awareness on obesity and nutritional diversity targeting the populations of all age groups.
- ▶ Raise awareness to inform stakeholders on the impact of the current COVID-19 crisis on changes in nutrition and lifestyle-related behaviors among Palestinian adolescents.
- ▶ Inform stakeholders of vulnerable populations who are at risk of obesity or malnutrition, and provide assistance and services for them.
- ▶ Distribute emerging research, best practices, community-based efforts and effective national, regional, and global policy strategies to prevent childhood overweight and obesity.


In terms of networking and policy formulation


- ▶ Bring together stakeholders including government, civil society, municipalities, universities, non-governmental organizations, youth organizations and others to address obesity among school children/adolescents.
- ▶ Bring together stakeholders to share knowledge, strengthen partnerships and cross-sector collaborations, and to address socio-ecological factors.
- ▶ Initiate the implementation of policies by stimulating a policy dialogue involving several stakeholders, including labelling of nutritional facts.
- ▶ Foster networking and exchange of know-how amongst institutions and professionals, on a national and international level.
- ▶ Prioritize the obesity epidemic as an urgent public health matter with coordinated public and private sectors.
- ▶ Pave the way to developing a national strategy and action plan in Palestine targeting childhood obesity.
- ▶ Elevate evidence and practice-based strategies that focus on reducing inequities in high-risk, low-income communities.
- ▶ Provide a platform to discuss the double burden of nutrition and identify important challenges to be considered when planning a national strategy to prevent childhood obesity in Palestine.
- ▶ Mobilize resources to implement drafted policies to combat obesity. Enhance the coordination and cooperation of various actors and to assess how to scale up nutrition programs and jointly tackle childhood obesity.


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