Lifestyles of Palestinians during the COVID-19 pandemic: A cross-sectional study

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Abstract
Background: Although the COVID-19 epidemic was linked to movement limitations and a sense of risk among the general public, changes in lifestyle and mental health were not examined among Palestinians. The study aimed to investigate changes in a group of Palestinians’ lifestyles and mental health. Methodology: A translated questionnaire about demographics, mental health difficulties, and lifestyle choices was created using Google Forms and distributed over social media and academic platforms. SPSS 21 was used to analyze the data. Results: The participants’ mean age was 25.9 years, 67% were women, and 47% were city dwellers. About 82% had a bachelor’s degree. Infection with COVID-19 was present in 13% of study group, COVID-19 infection caused the death of a relative in 13% of study group, and commitment to limits was present in 14% of study group. Negative emotions like despair, hopelessness, and worry were extremely common. Despite eating a few fruits and vegetables and drinking a lot of soft beverages, study participants were generally active. Conclusion: The COVID-19 pandemic is associated with a negative impact on lifestyle and mental well-being.

Keywords
COVID-19, pandemic, lifestyle, diet, mental well-being

Introduction
Acute respiratory illness linked to Corona virus-2 (Covid-19) was first identified in Wuhan, China, in December 2019. About 505 million cases of Covid-19 infection were reported in April 2022, and it was responsible for 6.2 million fatalities across 200 nations (Islam et al., 2022b). Physical, emotional, and social wellness were affected as a result of the COVID-19 pandemic. It also has been linked to other infections such as diarrhea, in addition to affecting the respiratory system (Rahman et al., 2022b). In November 2021, a new variant (SARS-CoV-2) omicron was identified and is known to be contagious and resistant to immunity (Sohan et al., 2022).

Restaurants were empty and closed during the COVID-19 pandemic, and travel became difficult with only 10% of flights operating. Given the high rate of infection associated with losing restrictions, many leading politicians struggled to decide whether a lockdown should be imposed or not (Gros et al., 2020). Natural disasters are frequently linked to a negative impact on mental health and post-traumatic stress disorder, which includes depression and anxiety, among other behavioral issues (Makwana, 2019). WHO recommended social distancing or physical distancing which leads to a higher risk of loneliness. Loneliness has been linked to all-cause mortality in previous reports (Sood, 2020).

Staying at home, virtual education and working, limiting outdoor and gym physical activities, limiting shopping and stockpiling food, and boredom were all linked to higher energy intake and lower physical activity. Furthermore, stress is associated with eating junk food high in sugar, salt, and calories, as well as eating less healthy food (Di Renzo et al., 2020). Unhealthy habits, such as a poor diet, a lack of exercise, and the use of tobacco and alcohol, are the main factors of the world’s disease burden and an increased risk of mental illness (Balanzá-Martínez et al., 2020).

Regular exercise enhances mental health, lowers the risk of hypertension and obesity, and prolongs life. Low physical activity and increased calorie consumption lead to...
weight gain and raise the risk of developing chronic diseases (Yıldız, 2020). As a result of the coronavirus pandemic, sleep quality has decreased, which could further raise the burden of chronic disease (Wang et al., 2020).

The Palestinian Authority (PA) imposed a strict lockdown at the beginning of the coronavirus pandemic. Eventually, the lockdown was loosed leading to a spike in the coronavirus in OPt, with an increase of 9000 cases as of July 18, 2020, compared to less than 400 cases at the end of lockdown (Hammoudeh et al., 2020). Israeli military occupation of the West Bank and Gaza strip has lasted over 50 years with a lack of access to water, land, borders, and free movement.

Palestinian Authority and the ministry of health have practiced extreme efforts to handle the pandemic, but with limited access to resources and borders, this was very challenging, especially imposing lockdown with consequently lost income for small businesses and workers (Hammoudeh et al., 2020). In this study, we aimed to study the lifestyle of Palestinian people during pandemic and whether commitment to lockdown was associated with a decline in indicators of healthy lifestyle patterns.

Methods

A cross-sectional design was used to assess aspects of lifestyle and mental well-being among Palestinians using an electronic data collection tool (google forms) distributed through various social methods such as Facebook and professional, social, and student Facebook groups. All Palestinians living in the West Bank, Gaza, and Israel represent the population. Due to lockdown regulations and a limited budget, although based on a margin of error of 5%, confidence level of 95%, and population size of 24,000, 380 was supposed to be the sample size, we only used a convenient sampling of 152 people were included in the study which is only equal to 40% response rate.

The data collection tool was a translated questionnaire (Goodyear-Smith et al., 2004). Participants were asked about smoking, drinking, negative emotions, physical activity, sleeping, medications, skin and sex performance, soft drinks, demographic factors, and behavioral changes due to closure.

Ethical consideration

The research was conducted in accordance with the Declaration of Helsinki and approval from the IRB at An Najah National University was obtained before conducting the study. The agreement of participants was ensured through acceptance of the invitation and answering the questionnaire.

Consent for publication

Not applicable.
Statistical analysis

Data were summarized using percentages. So the answers to study questions were based on a Likert scale from 0 to 5 and were considered a continuous variable.

Differences in study variables between people (who were committed to lockdown or not) were calculated using t-tests. Data were analyzed by IBM SPSS21.

Results

The average age of the study participants was 25.5 ± 9 years. They mostly live in cities and villages. The majority were females and had bachelor’s degrees. Only 50% of the study group had jobs as of this writing. In general, the majority of participants indicated good health and well-being. A few percent confirmed having chronic conditions. Less than 10% had asthma, anemia, and mental health issues.

Only 13% of the study group had COVID-19 infection, 13% said they had lost loved ones due to the COVID-19 pandemic and 14% of the study group had agreed to follow the Palestinian ministry of health’s stringent guidelines. About 18% of people smoked, while just the minority drank or used drugs (Table 1).

Table 2 describes the study participants’ mental health and lifestyle during the COVID-19 pandemic. Almost 65% of study participants reported some level of sadness, 67% reported a loss of interest in previously enjoyed activities, and 79% indicated a type of anxiety. Furthermore, a high percentage of participants reported being physically active during the pandemic, and 58% were concerned about their BMI changing. Almost all participants slept well. And 43% declared eating at least three servings of fruits and vegetables per day. Less than half of the study participants reported fear for their skin, hair, and problems with their teeth and gums, while very few experienced side effects from the medication.

Figure 1 depicts the lifestyle changes caused by the COVID-19 pandemic. A high percentage of our study participants reported changes in eating habits, physical activity, sleeping habits, social support, and addictive habits, but less than half of the participants confirmed changes in time spent out.

Table 3 describes mental health and lifestyle during the pandemic among those who committed to lockdown or not. In summary, those who committed to lockdown were more concerned about their weight, hair, and skin. Other lifestyle and mental aspects were not different among those who committed to lockdown or not.

Discussion

In this study, we found a significant rate of unhappiness, a loss of interest in favorite hobbies, and anxiety among young participants who either, were working or studying. The study participants confirmed eating a bad-quality diet, with fewer fruits and vegetables and more soft beverages. Additionally, they mentioned less social support. Although there were no addiction issues in our study group, this may not have been fully disclosed considering how sensitive this subject is in the context of Palestinian traditional culture. Lower mental and lifestyle traits were not linked to a commitment to restriction.

We document a significant rate of declining mental health in this study group, involving feelings of despair, a lack of interest in favorite activities, and anxiety. According to earlier research in a study conducted in the United Arab Emirates, women tend to have lower mental quality, and improved mental health is associated with better food, more physical activity, and better sleep ratings (Kilani et al., 2020). The COVID-19 pandemic was unquestionably associated with a decreased capacity for outdoor activity, which may be related to a decrease in chemicals that affect moods, such as serotonin and endorphins.

In addition, reduced exposure to UV radiation may lead to the lower formation of vitamin D, which protects against depression (Kilani et al., 2020). A longitudinal study among a sample of participants from the UK during the COVID pandemic indicated that symptoms of anxiety and entrapment decreased with time, but depressive symptoms did not change (O’Connor et al., 2020). Among the causes of hopelessness are socioeconomic barriers and job losses (Otu et al., 2020).

Stress is associated with increased energy consumption and unhealthy dietary patterns that include a high intake of sugar and fat diet (Yau and Potenza, 2013; Anton and Miller, 2005). During the COVID-19 pandemic, physical inactivity increased and was associated with weight gain. Depression was related to higher consumption of saturated fat, energy-dense foods, and salty foods (Rolland et al., 2020). Anxious people snack 2.45 times more (AlMughamis et al., 2020). The COVID pandemic is linked to increased consumption of biscuits and cakes and decreased consumption of fruits and vegetables (Kriaucioniene et al., 2020). Indeed in our study, participants reported an increased intake of soft drinks and a reduced intake of fruits and vegetables.

The fact that the high percentages of study participants were women may have contributed to their concern about their hair and complexion.

The release of stress hormones such as glucocorticoids and adrenaline was correlated to psychological stress. The skin is now understood to be an immediate stress target, and the release of these hormones may be associated with physiological stress. The dermis and epidermis make up the majority of the skin, which is thought of as an organ that protects our bodies from the effects of the environment. The interaction between the brain and skin was discussed elsewhere (Chen and Lyga, 2014). In a prior study, depression was associated with an increase in cortisol levels in the hair, but hair cortisol levels were not related to stress. Stress may be evaluated by cortisol levels in hair, but hair cortisol level was not associated with sleep hours in participants who are 25–33 years (Mayer et al., 2018).
Reporting on sexual satisfaction might not give an accurate picture of the issue because of its conservative society with a predominantly Muslim population. Our study group did, however, express overall sexual well-being. Our assessment of this component may have been impacted by the fact that our study group was very young.

| Variable                                                                 | No   | Never | Hardly feel that | Sometimes feel that | Often feel that | Always feel that |
|--------------------------------------------------------------------------|------|-------|------------------|--------------------|-----------------|-----------------|
| Mental condition                                                         |      |       |                  |                    |                 |                 |
| Experience of sadness or hopelessness                                    | 3 (2%) | 28 (19%) | 21 (14%) | 58 (38%) | 26 (17%) | 15 (10%) |
| Experienced a sense of loss of interest in doing loved things             | 6 (4%) | 18 (12%) | 26 (17%) | 76 (50%) | 0              | 25 (17%) |
| Experience anxiety and stress due to worries of everyday life             | 4 (3%) | 9 (6%) | 19 (13%) | 80 (53%) | 0              | 39 (26%) |
| Life style                                                               |      |       |                  |                    |                 |                 |
| Spent most of the time physically inactive                               | 6 (4%) | 101 (66%) | 22 (14%) | 0          | 0              | 23 (15%) |
| Experienced a sense of loss of interest in doing loved things             | 12 (8%) | 41 (27%) | 10 (7%) | 38 (25%) | 0              | 50 (33%) |
| Experienced anxiety and stress due to worries of everyday life            | 14 (15%) | 32 (33%) | 16 (17%) | 0          | 0              | 34 (35%) |
| Take less than 3 serving of vegetables and fruits daily                  | 3 (2%) | 33 (22%) | 29 (19%) | 52 (34%) | 0              | 35 (23%) |
| Drinking soft drinks with a lot of sugar (juice and cola)                | 11 (7%) | 19 (13%) | 33 (22%) | 55 (36%) | 0              | 33 (22%) |
| Unhappy with the quality of sleeping                                     |       |       |                  |                    |                 |                 |
| Spent most of the time physically inactive                               |       |       |                  |                    |                 |                 |
| Experienced a sense of loss of interest in doing loved things             |       |       |                  |                    |                 |                 |
| Experienced anxiety and stress due to worries of everyday life            |       |       |                  |                    |                 |                 |
| Take less than 3 serving of vegetables and fruits daily                  |       |       |                  |                    |                 |                 |
| Drinking soft drinks with a lot of sugar (juice and cola)                |       |       |                  |                    |                 |                 |
| Nutritional changes                                                      |       |       |                  |                    |                 |                 |
| Spent most of the time physically inactive                               |       |       |                  |                    |                 |                 |
| Experienced a sense of loss of interest in doing loved things             |       |       |                  |                    |                 |                 |
| Experienced anxiety and stress due to worries of everyday life            |       |       |                  |                    |                 |                 |
| Take less than 3 serving of vegetables and fruits daily                  |       |       |                  |                    |                 |                 |
| Drinking soft drinks with a lot of sugar (juice and cola)                |       |       |                  |                    |                 |                 |
| Nutritional changes                                                      |       |       |                  |                    |                 |                 |

**Table 2. Percentages of study participants according to their mental and lifestyle aspects.**

**Figure 1.** Lifestyle changes due to pandemic. Series (blue): Yes. Series (orange): No.
Table 3. Comparison of mental wellbeing and lifestyle according to lockdown.

|                        | Lockdown | t-test | P value |
|------------------------|----------|--------|---------|
|                        | No       | Yes    |         |
| Experience of sadness  | 2.62 ± 1.43 | 2.84 ± 1.43 | -0.75  | 0.45   |
| or hopelessness        | 21       | 128    |         |
| Experienced a sense    | 2.76 ± 1.44 | 2.82 ± 1.26 | -0.19  | 0.85   |
| of loss of interest    | 21       | 128    |         |
| in doing loved things  |          |        |         |
| Experience anxiety      | 3.24 ± 1.37 | 3.19 ± 1.27 | 0.17   | 0.87   |
| and stress due to      | 21       | 128    |         |
| worries of everyday    |          |        |         |
| life                    |          |        |         |
| Spent most of the      | 1.76 ± 1.37 | 1.76 ± 1.37 | 0.14   | 0.89   |
| time physically inactive| 21      | 129    |         |
| Worrying about weight  | 1.71 ± 1.62 | 2.99 ± 1.75 | -3.14  | 0.002  |
| change                  | 21       | 128    |         |
| Unhappy with the       | 2.67 ± 1.49 | 2.65 ± 1.63 | 0.04   | 0.97   |
| quality of sleeping    | 21       | 129    |         |
| Take less than 3       | 2.52 ± 1.21 | 2.83 ± 1.49 | -0.89  | 0.38   |
| serving of vegetables  | 21       | 129    |         |
| and fruits daily       |          |        |         |
| Drinking soft drinks   | 1.00 ± 1.04 | 1.24 ± 1.10 | -0.97  | 0.33   |
| with a lot of sugar    | 21       | 127    |         |
| (juice and cola)       |          |        |         |
| Fear about hair and    | 2.71 ± 2.0 | 3.71 ± 1.54 | -2.63  | 0.006  |
| skin health            | 21       | 128    |         |
| Feeling problem with   | 2.65 ± 1.7 | 2.24 ± 1.5 | 1.11   | 0.27   |
| gums and teeth         | 20       | 127    |         |
| Satisfied by sexual    | 0.94 ± 1.30 | 0.99 ± 1.02 | -0.17  | 0.87   |
| performance            | 18       | 99     |         |
| Suffering from side    | 2.70 ± 1.52 | 2.76 ± 1.49 | -0.17  | 0.87   |
| effect of medication   | 20       | 129    |         |

Participants in our study described a change in social support during the pandemic. Unfortunately, the research questionnaire was not designed to extract more details regarding the kind of social support that the Palestinian community anticipated. Family ties might have been slightly strained as a result of the loss of resources and income, nevertheless. Numerous studies have suggested that the pandemic increased the likelihood of violence against women because confinement affected how partners interacted with one another (Solórzano et al., 2020; Ulrich, 2000). The social effects of the pandemic on Palestinian society have not been studied, according to the authors.

The pandemic imposed limits on social gatherings, marriages, and even funerals, despite the fact that Palestinian society is generally focused on extended families and close friendships.

Prior to the outbreak, 64% of Gazans and 30% of West Bank residents were classified as impoverished, while the young unemployment rate was 38%. In any attempt to COVID in oPt, gender should be taken into consideration (Abuzerr et al., 2021). Compared to another research team, our study revealed Palestine to have a higher rate of distress. Worry was linked to a greater risk of distress and insecurity in the COVID-19 (OR 1.77 (1.46–2.14) and OR 4.3 (3.53–5.23), respectively (Ghandour et al., 2020).

The Palestinian society is in health transition. The pandemic as is shown in this study increased the risk of unhealthy eating, drinking soft drinks, and although participants did not report low physical activity, they were concerned about their weights and reported low intake of fruits and vegetables which could increase the risk of chronic diseases in the future. It is even suggested that the duration of lockdown will negatively impact the glycemia and increase the rate of diabetes-related complications (Lim et al., 2020).

Getting vaccinated against COVID-19 infection is the best method to reduce the burden that comes with it (morbidity and mortality). About 61.5% of the world’s population had at least one COVID-19 infection as of January 26, 2022 (Hossain et al., 2022). Data on vaccinations were not accessible to us because the data collection for this study took place in the winter of 2020. It is evident that acceptance of and attitudes about the vaccine were influenced by a variety of social factors, including sex, marital status, education, career, family history, and risk of infection (Hossain et al., 2022).

The COVID-19 virus poses a threat to public health systems, particularly in developing nations, due to a number of causes, including the rise in chronic diseases. Symptoms of the infection include fever, coughing, fatigue, loss of taste and smell, difficulty breathing, and shortness of breath that may resemble bacterial pneumonia. These might result in a rise in the improper use of broad-spectrum antibiotics, which might cause bacterial resistance (Daria and Islam, 2022a). The coronavirus continuously mutates to produce omicron and delta viruses as a viral infection. Potentially, more infectious and virulent than the previous strain. The severity of symptoms and the efficiency of the vaccine are correlated with the type of virus that infected you (Islam et al., 2022a).

In countries with a high rate of COVID-19 infection, not only chronic diseases increased, but infectious diseases like dengue fever raised also (Rahman et al., 2022a).

Data for this study were collected at the start of the COVID-19 pandemic when data on the omicron variant could not be collected. The continuous emergence of COVID-19 cases is associated with a high surge of disease, increased morbidity, and mortality. For example, the omicron variant is more contagious and less lethal than the delta variant. However, reports from Egypt and Israel indicate that COVID-19 infection may coexist with other infections (such as the flu) in the same person, making the disease more dangerous (Mohapatra et al., 2022).

The high rates of negative feelings associated with the pandemic may reflect a high level of awareness of the...
impact of COVID-19 infection on human health, as our study oversampled students from health professions. In constant with a study involving 395 pharmacy students in Bangladesh, 53.2% had a high-risk perception, 17.2% had a high knowledge level, and 41.7% confirmed taking precautions against COVID-19 infection (Ether et al., 2022).

COVID-19 has reduced the need for intensive care units (ICU) by 50% in the United States and the United Kingdom after mid-January 2022. Moreover, admissions to ICU and mortality due to COVID-19 have decreased by approximately 80% in Canada and South Africa, which was associated with the omicron variant of COVID-19.

Preliminary data suggest that Omicron spread is associated with reducing the COVID-19 pandemic (Daria and Islam, 2022b). COVID-19 infections due to the Omicron variant are milder including fever, sore throat, and aches but lower rates of low oxygen saturation, abnormal pulse rates, and shortness of breath (Mohapatra et al., 2022).

Finally, we found that the coronavirus had a negative impact on Palestinian communities’ mental health, dietary habits, physical activity, and weight satisfaction. During the pandemic, Palestinians reported eating fewer fruits and vegetables and experiencing a significant change in social support. Lockdown commitment was not linked to poor mental health or an unhealthy lifestyle. Participants who reported being committed to restrictions, on the other hand also fear weight gain and fear for their skin and health.

The pandemic has been going on for 2 years, with the majority of Palestinian universities and workplaces using a virtual system of providing services and working, which could increase sedentary lifestyle and lower quality diet, which could translate into a higher prevalence of obesity, diabetes, and chronic diseases, so efforts in this area are needed to prevent a decline in community wellbeing.

This study should pave the way for addressing mental health issues among young people affected by the corona pandemic. Efforts should also be made to improve diet and exercise, particularly bad dietary habits associated with stress. Therapy groups can be formed to address the subtle effects of the corona pandemic on disease risk. Online courses on behavior modification could be beneficial.

Authors' contributions

NN designed the study, collected data, analyzed data, and wrote part of the manuscript. MT obtained IRB approval and revised the manuscript.

Competing interest

None.

Consent for publication

All the study authors read and approved the manuscript for publication.

Consent form

The goals of the study were discussed on social media platforms and participants were asked to fill online survey if they want to participate in the study and filling the form was considered consent to participate in the study.

Data availability

The datasets generated and/or analyzed during the current study are not publicly available due (being kept confidential for future work) but are available from the corresponding author on reasonable request.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

This study was approved by Najah University IRB board.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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