

Eating Habits and Lifestyle Changes During COVID-19 Pandemic Among Healthcare Professionals in Dubai Health

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Abstract

Background: The COVID 19 impacted global lifestyles, causing major issues for healthcare workers because of their position in the front line. The present research aimed to understand the effects of COVID-19 on the dietary preferences and lifestyle alterations of healthcare staff working in Dubai Health (DH), a population that should possess better health literacy but is likely to face significant stress and workload variations during the pandemic. **Objective:** To assess changes in dietary behavior, physical activity levels, sleep, smoking, and stress levels during the COVID-19 pandemic among Dubai Health; Healthcare Professionals, and to determine demographic and lifestyle predictors of these behaviors. **Methods:** A cross-sectional study was conducted using online questionnaires administered to 413 DH Healthcare Professionals. The questionnaire was validated and distributed to participants in both English and Arabic. It includes questions on sociodemographic data, lifestyle changes in eating habits, physical activity, smoking, and sleep patterns in the context of the COVID 19 pandemic. Data were analyzed using descriptive statistics and cross-tabulation. Ethical clearance was obtained from the Dubai Scientific Research Ethics Committee. **Results:** This study examined healthcare professionals' lifestyle behaviors and perceptions during COVID-19. The majority were female (82%), aged 35-44 (41%), and predominantly Asian (60%). Most resided in Dubai (75%) and were nurses (39%). Chronic diseases affected 81% of participants. Unhealthy lifestyle behaviors were prevalent, with 90% exhibiting three or more. Minimal changes were noted in physical activity (33%), food intake (54%), and sleep (72%). Stress increased for 61%, with prayer (36%) and entertainment (32%) as common coping strategies. Dietary shifts favored home-cooked meals (78%), and 70% believed vitamins strengthened immunity. Vitamin C (60%) and D (38%) were widely used. Women showed greater declines in physical activity and smoking, while married individuals reduced smoking more than singles. These findings highlight behavioral shifts influenced by demographic factors during the pandemic. **Conclusion:** This study highlights significant lifestyle and behavioral changes among healthcare professionals during COVID-19. High stress levels, poor diet, and inactivity were common, with prayer and entertainment as key coping mechanisms. Women saw greater declines in physical activity and smoking, while married individuals reduced smoking more than singles. Despite widespread belief in vitamins for immunity, unhealthy habits persisted. These findings underscore the need for targeted interventions to support mental health, nutrition, and physical activity in healthcare workers during crises.

Implications: These insights into lifestyle changes therefore have the utility of designing health promotion intervention programs for HCWs in the future. Proactively, the following practice propositions are critical for developing hardiness within this vital employee population, especially during health crises.

Keywords: Covid-19, Eating Habits, Healthcare Professionals, Dubai Health

Introduction

The new coronavirus, known as COVID-19, was identified in December 2019 in Wuhan City, Hubei Province, China, Class M3 has led to extensive disruptions at the global level, having a severe impact on population health, the economy, and people's daily routines. COVID-19, which was declared a pandemic by the World Health Organization (WHO) on the 11th of March, 2020, caused a closedown and changes in people's life and work patterns. Given the status of frontline workers, these essential members of the healthcare sector are exposed to unique physical and psychological hazards of

daily work, diet changes, limited physical activity, and psychological distress.

Physical activities, proper diets, sufficient hydration, and quality of sleep help strengthen the immune system and strengthen the body and mind. These factors are especially relevant in stress and context disruptions associated with worsening health (Di Renzo et al., 2020). However, these pressure sources were disrupted in various populations, including HCWs, owing to the COVID-19 pandemic and other factors that are considered to be unique sources of pressure.

Research across the globe has noted a shift in dietary practices and changes in behavior during the pandemic. For

example, Desphande et al. (2022) found that a higher proportion of the population in Italy presently eats more frequently and skips meals less due to stress. Frequent meal consumption pattern shifts were also recorded in the UAE, as noted by Ismail et al. (2020), due to restrictions in lockdown. Additionally, Catucci et al. (2021) observed that people gained weight and slouched in Italy and other European countries during quarantine, which shows the extent of the effects.

However, the present study identified a dearth of research within this healthcare population, despite a predicted higher understanding of nutrition among such individuals because of inherent stress factors related to practice. Yaman and Hocaoglu (2023) identified that the workers in the healthcare sector experienced important changes in their diet during the pandemic, including changes in the types of foods they ate and changes in the times they ate them. Vargas et al. (2023) reported the same phenomenon in Brazilian healthcare employees, wherein weight gain and reduced physical activity are well expressed, caused by both working stress and COVID-19.

The major actors who are the local healthcare professionals in the UAE are at the DH where they undertake crucial duties in handling health and disease control, especially in the current pandemic. Nevertheless, the detailed effects of COVID-19 on lifestyle dietary patterns and behaviors have not been adequately examined. Casas et al. (2022) noted that variation in the population requires consideration for the development of health interventions, which is a gap filled by this study.

Purpose of the Study

This study assesses how the COVID-19 pandemic affects the health-related behaviors of DH healthcare professionals, regarding the following main four domains of behaviors: physical activity, diet, smoking, and sleep patterns. Therefore, to ensure the identification of trends and the causes behind them, this study aimed to provide simple and focused health promotion strategies for HCWs.

Significance of the Study

This population engages in the arduous and stressful tasks of addressing public health emergencies and, additionally, is a vulnerable population experiencing negative health effects due to their work. It is therefore important to understand how the pandemic impacted their lifestyle behaviors to build interventions that would promote their well-being during emergencies. Furthermore, the present work advances the knowledge of COVID-19's informational and behavioral consequences among key stakeholders in the Middle Eastern healthcare field.

Research Objectives

- To assess changes in eating habits and lifestyle behaviors among Dubai Health healthcare professionals during the pandemic.
- To evaluate the prevalence of positive and negative changes in dietary patterns, physical activity, smoking, and sleep.

Hypotheses:

- Healthcare professionals have experienced significant lifestyle changes during the pandemic, including increased food intake, decreased physical activity, and disrupted sleep patterns.

This study aims to fill a critical gap in understanding how healthcare professionals in Dubai Health adapted to the challenges of the

COVID-19 pandemic. The findings provide valuable insights for promoting healthier lifestyles among healthcare workers and preparing for future public health emergencies.

Literature Review

The Coronavirus Disease (COVID-19) started in Wuhan city, China, in December 2019, but has since spread to virtually every country worldwide. In light of the extensive spread of the disease and the increase in the number of COVID-19-related deaths, the World Health Organization (WHO) designated COVID-19 as a pandemic on 11th March 2020 (Cucinotta & Vanelli, 2020). This designation implies that the spread of diseases has overwhelmed the healthcare system and impaired the ability to deal with routine lifestyles (Public Health Agency of Canada, 2020). Healthy lifestyle and Immunity are interrelated, as a healthy lifestyle is an essential key to maintaining a healthy immune system (Aslam MF, Majeed S, Aslam S, & Irfan J., 2017; Harvard Health Publishing, 2021). Researchers emphasize that increased nutritional awareness represents a critical factor contributing to the mitigation of the negative consequences of diseases and maintaining healthy lifestyles (Alkhalidy, 2019) (Barbosa et al., 2016). In a study by Barbosa et al. (2016), it was concluded that the degree of individuals' knowledge about the impact of nutrition on immunity is associated with several factors, such as occupation and socioeconomic status.

Sufficient nutrition knowledge is essential, regardless of individuals' occupations and goals (Venter et al., 2020; Alkhalidy, 2019). According to the article, nutrition performs vital functions, such as maintaining overall health, preventing malnutrition, and preventing chronic diseases. Researchers note that improper nutrition can result in different dysfunctions such as cardiovascular (Jeruzska-Bielak, Kollajtis-Dolowy, Santoro, Ostan, Berendsen, Jennings, A., Pietruszka, 2018, p. 2). In a system review paper by Ali, AlShawai, & Habib (2019), the writers found a specific relationship between different types of food and increasing immunity. This study showed that high amounts of natural yeast are found in dairy products produced from unpasteurized milk. These natural yeasts play a vital role in fermenting undigested fiber from food into essential substances that enhance immunity and secrete them into blood circulation. Furthermore, products rich in protein, vitamin C, water, green vegetables, local and seasonal fruits, and vegetables are essential for boosting immunity (Devika and Tahira Banu, 2016). Drinking enough water depending on the individual's requirements (30-35 ml/kg) helps protect the respiratory tract by "sedimentation of mucus membrane" which thereby enhances the production of white blood cells and antibodies in the bloodstream (Ali, AlShawai, & Habib, 2019).

Di Renzo et al. (2020) conducted an Italian-based study to determine the relationship between COVID-19 lockdown and eating and lifestyle changes for an Italian-based population aged 12 years and above. The research established a positive correlation between lockdown and changes in eating patterns. Specifically, Di Renzo et al. (2020) contended that 33.3% of the respondents confirmed that they felt hungrier before the main meals in the wake of the lockdown, resulting in increased food consumption. Furthermore, the working schedule change contributed to an increase in night snack uptake despite the decline in junk food consumption. These results are in line with the framework presented by Singh (2014), who hypothesized that increased food consumption is one of the methods people use to reduce the adverse outcomes of economic and social stressors. In this case, the spread of COVID-19 coupled with the subsequent lockdown was a stressor that prompted a change in dietary behavior.

Gornicka et al. (2020) conducted a study using 2,381 Polish adult respondents to determine the effect of COVID-19 and the subsequent lockdown on lifestyle and dietary habits. This research established that people with unhealthy nutritional patterns before the pandemic continued with the same behavior during the pandemic. For example, 64% of respondents in the unhealthy category reported that they consumed more food during the lockdown. In contrast, more than 50% of respondents in the healthy category reported an increase in fruit consumption instead of increased food intake. The rationale for this difference is that individuals with higher education levels are more health-conscious than those with limited education (Pu et al., 2020). Consequently, when reviewing healthcare professionals' behavior during the lockdown, it is expected that they are more aware of the need for healthy food consumption.

According to a study by Ismail et al. (2020), COVID-19 and the subsequent lockdown imposed adverse effects on individuals' dietary and lifestyle behaviors in the Greater Middle East. The authors conducted research focused on 18 countries in the Greater Middle East, including Jordan, Kuwait, Algeria, Oman, and Qatar, and observed an increase in the number of meals per individual during the pandemic compared to before implementing the measures taken to curb the spread of COVID-19. Specifically, only 2.2% of the respondents consumed at least five meals a day before the pandemic, compared to 6.2% of the respondents who consumed at least five meals a day after the pandemic. Notably, 64.4 number of the respondents skipped meals before the pandemic, but this rate declined to 45.1% during the pandemic (Ismail et al., 2020). These changes can be attributed to stress and disruption in sleep patterns. These factors induce an increase in energy demand, prompting people to increase food consumption.

Evers et al. (2018) agree with the preceding argument by Cheikh Ismail et al. (2020) by noting that negative emotions are positively correlated with increased food consumption. Additionally, disruption in sleeping patterns imposes stress and emotional imbalance, a combination of which induces increased food consumption. Cross-sectional research on the effect of the COVID-19 lockdown on eating and lifestyle changes in the UAE by Radwan et al. (2020). noted a positive correlation between lockdown and weight gain due to increased food consumption. Specifically, the study contends that approximately 33% of the respondents reported a change in dietary and lifestyle behavior characterized by consuming more meals and a decline in the number of people skipping at least one meal per day. These results align with the research results conducted by Al-Domi et al. (2021) in Jordan, pointing to adverse changes in healthy behavior.

One striking observation was presented by Jackson et al. (2020), who noted that smokers in the United Kingdom reduced their smoking levels because of the association between increased smoking and adverse COVID-19 outcomes. However, the research also notes that a majority of the participants did not withdraw completely from smoking because there was a lower level of adherence to COVID-19 mitigation measures among smokers compared to the rest of the population.

A study of 211 participants from the United States conducted by Dunton et al. (2020) explored the impact of COVID-19 on physical activity among young adults. The study established that there is a positive correlation between COVID-19 and reduced physical activity attributable to lockdown measures, including the closure of schools. In summary, the results of the studies conducted in Italy and Poland show an increase in weight gain among the respondents attributable to an increased number of meals per day and a decline in the number of participants skipping meals, ultimately leading to weight gain among the participants (Di Renzo

et al., 2020). Similar results were observed in studies conducted in the Middle East and UAE. The hallmark observation was a positive correlation between COVID-19 and subsequent lockdown and adverse changes in eating habits and lifestyle behavior.

A similar study conducted by Radwan et al. (2020) showed the effect of the lockdown on changes in dietary habits and lifestyle in the UAE. This study focused on the prevalence and determinants of unhealthy behavior changes during the COVID-19 lockdown among residents of the United Arab Emirates. However, our study focuses on investigating the impact of the COVID-19 pandemic on eating habits and lifestyle changes among Dubai Health health care professionals in the Emirates of Dubai, and no published data to date was found focusing on this target group in UAE or the Middle East.

Methodology

Study Design

This study used a cross-sectional survey approach to examine the impact of the COVID-19 pandemic on dietary behavior and new lifestyles of DH healthcare workers. A cross-sectional design was used because it allows one to obtain relevant data about the target sample in terms of their experiences and behaviors during the pandemic in a relatively short time. This approach was particularly useful for capturing comprehensive patterns of diet and lifestyle changes over time without the need for extensive data capture.

The study design was aimed at assessing the quantitative or qualitative improvement of lifestyle and the effects of the pandemic on healthcare professionals who were challenged differently as they were frontline workers.

Ethical Approval

Recruitment and data collection for this study were approved by the Dubai Health Authority Ethics Committee through the Dubai Scientific Research Ethics Committee (DSREC). The reference number for approval is DSREC-05/2021_02. Each participant signed an informed consent form that allowed them to participate in the survey. Everyone was offered an opt-out option, and no personal data identifying the subjects was gathered to reduce participant risk and generalization. Participation in the study was voluntary, and the study complied with the principles of the Declaration of Helsinki for human research.

Study Population and Target Group

The target population comprised healthcare professionals employed under the DH. This group was chosen because the participants work directly, as they are clients and employees, and are also part of the population that has been affected by pandemic stressors. The inclusion criteria were as follows:

- Employment: Current employment with Dubai Health as a healthcare professional.
- Willingness to Participate: Voluntary completion of the survey after understanding the study's objectives.

The study sample included 413 healthcare professionals, encompassing a wide range of roles.

- Physicians: Consultants, specialists, and general practitioners.
- Dentists and Dental Technicians.
- Pharmacists and Dispensers.
- Nurses.
- Technicians (e.g., radiology, laboratory, and other medical technicians).

The participants represented various professional categories, age groups, and educational backgrounds, providing a diverse and representative sample.

Sampling Methodology

Population Sample: The study adopted a convenience sampling technique in which the survey was disseminated through official DH communication channels, such as hospitals and primary healthcare facilities. Convenience sampling was used because it was easy to implement and it took a shorter time to access a large group of HCWs. Nevertheless, this approach also leads to certain forms of bias, for example, getting people to digital media more often.

Data Collection

The questionnaire was adopted and verified by Radwan et al. (2020) and was developed using Microsoft Forms for online completion. The survey was conducted online using an email sent to all HC facilities under DH, which created access to different participants. The ones selected to fill out the survey could use either English or Arabic since the target population is multilingual.

The survey link remained active for two months, during which reminders were sent periodically to encourage participation. The online format was chosen as follows:

- Ensure compliance with social distancing measures.
- Facilitating Anonymous Responses.
- Provide participants with the flexibility to complete the survey at their convenience.

Survey Instrument

The survey instrument consisted of closed-ended questions designed to gather data on the following topics.

Demographic Information

- Age, gender, marital status, nationality, educational qualifications, and type of residence.
- Professional role (e.g., physician, nurse, pharmacist).

Lifestyle Changes

- Changes in physical activity, food intake, smoking habits, weight, and sleep patterns during the pandemic.
- Perception of these changes as positive or negative.

Dietary Practices

- Types of foods consumed, frequency of meal preparation at home, and intake of specific food groups, such as fruits, vegetables, and processed foods.
- Use of dietary supplements (e.g., vitamins C and D) and herbal remedies.

Coping Mechanisms and Stress Management

- Participants' methods of coping with pandemic-related stress, such as prayer, exercise, or meditation.
- Perceptions of quarantine as a preventive measure.

Preventive Practices

- Frequency of grocery shopping, methods of disinfecting groceries, and sterilization practices for delivered food items.

The questionnaire underwent a pilot testing phase with a small sample of healthcare professionals to ensure clarity, validity, and reliability of the items.

Variables Measured

The variables measured in this study included:

- Demographic Variables: Age, gender, marital status, education level, and type of residence.
- Lifestyle Variables: Changes in physical activity, dietary habits, body weight, smoking, and sleep.
- Dietary Practices: Frequency of home-cooked meals, consumption of specific food items, and use of supplements.
- Mental Health and Stress: Levels of stress and coping mechanisms.
- Preventive Behaviors: Grocery shopping frequency and sterilization practices.

Data Analysis

Data were analyzed using descriptive statistical methods. The following steps were employed:

- Data Cleaning: Responses were screened for incomplete or duplicate entries to ensure data quality.
- Descriptive Statistics: Frequencies and percentages were calculated for categorical variables, such as demographic characteristics and reported lifestyle changes.
- Cross-tabulations: Relationships between demographic factors and lifestyle changes were explored to identify trends and patterns.
- Graphical Representations: Key findings were visualized using tables and figures for clearer interpretation.

The analysis provided insights into the prevalence of specific lifestyle changes and their association with demographic characteristics.

Strengths and Limitations

Strengths

- The study targeted healthcare professionals, a critical yet understudied population during the COVID-19 pandemic.
- The bilingual survey ensured inclusivity and higher response rates among participants with different language preferences.
- The cross-sectional design facilitated a quick assessment of pandemic-related lifestyle changes.

Limitations

- The reliance on self-reported data introduced potential biases, such as social desirability bias.
- The use of convenience sampling limited the generalizability of findings to the broader healthcare workforce.
- The study design did not allow for longitudinal analysis or causal inferences.

Table 1: Summary of Methodological Components

| Component | Details |
|------------------------|---|
| Study Design | Cross-sectional survey |
| Target Population | Healthcare professionals employed by DH |
| Sample Size | 413 participants |
| Sampling Method | Convenience sampling |
| Data Collection Period | Two months |
| Survey Tool | Online questionnaire via Microsoft Forms (English and Arabic) |
| Survey Sections | Demographics, lifestyle changes, dietary practices, stress management, and preventive behaviors |
| Variables Measured | Demographic data, physical activity, dietary habits, smoking, sleep, and mental health |
| Ethical Approval | DSREC-05/2021_02 |
| Data Analysis | Descriptive statistics with frequencies, percentages, cross tabulation, and graphical representations |
| Strengths | Focused on a critical population; bilingual design |
| Limitations | Self-reported data; convenience sampling bias |

Results

Sample Characteristics

Table 2 described the sociodemographic characteristics of the study population. 82% were females compared to males 18%, the majority of the sample 41% were between 35-44 years old, 30% are <34 years old, 20% are between 45-54 years old, and the least sample were >55 years old are 9%. Over half of the study population (79%) were married and the majority are Asian 60%. Most DH healthcare professionals have a bachelor degree (59%). The Asian nationality was among the highest compared to others with 60%, the rest of the

sample was distributed as follows: Emirati (22 %), Arabs (16%), Western (1%), and other nationalities (1%). The most common place of residence was Dubai (75%) followed by Sharjah (22%), Ajman (3%). Most of the study sample are nurses 39%, followed by technicians, Physicians (consultants, specialists, general practitioners) 15%, Pharmacist and dispensers 8%, Dentist Dental technician 6%. 81% of the study sample are suffering from chronic diseases such as bronchial asthma, polycystic ovary syndrome, hypertension, diabetes, multiple sclerosis, hypothyroidism, hyperthyroidism, GERD, arthritis. Almost 71% reported living in an apartment.

Table 2: Sociodemographic characteristics of the study population (n=413)

| | | n | % |
|--------------------------------|--|-----|----|
| Age | <34 | 122 | 30 |
| | 35-44 | 170 | 41 |
| | 45-54 | 83 | 20 |
| | >55 | 38 | 9 |
| Gender | Male | 75 | 18 |
| | Female | 338 | 82 |
| Marital status | Married | 326 | 79 |
| | Single | 70 | 17 |
| | Divorced | 12 | 3 |
| | Widowed | 5 | 1 |
| Nationality | Emirati | 92 | 22 |
| | Arabic | 65 | 16 |
| | Western | 5 | 1 |
| | Asian | 248 | 60 |
| | African | 3 | 1 |
| Residence at | Dubai | 310 | 75 |
| | Ajman | 13 | 3 |
| | RAK | 1 | 0 |
| | Sharjah | 89 | 22 |
| Education Qualification | High school diploma | 8 | 2 |
| | Higher diploma | 40 | 10 |
| | Bachelor degree | 245 | 59 |
| | Master degree | 97 | 24 |
| | PhD | 23 | 6 |
| Category | Physicians (consultants, specialists, general practitioners) | 63 | 15 |
| | Dentist | 22 | 5 |
| | Dental technician | 3 | 1 |
| | Pharmacist and dispensers | 34 | 8 |
| | Nurses | 161 | 39 |
| | Technicians | 130 | 32 |
| Suffer from disease | Yes | 79 | 19 |

| | | | |
|---|-------------------------------|-----|----|
| | No | 334 | 81 |
| Body mass index (kg/m²) | Underweight (<18.5) | 6 | 2 |
| | Normal (18.5–24.9) | 135 | 33 |
| | Overweight (25.0–29.9) | 163 | 40 |
| | Obese (≥30.0) | 109 | 26 |
| Type of living | An apartment | 291 | 71 |
| | A house with a garden or yard | 122 | 30 |

The description of the lifestyle behaviors as well as the overall unhealthy lifestyle score is presented in Table 3. For all the lifestyle characteristics considered, almost 33% of the study population did not change behavior in regards to physical activity; 54% in food intake, 44% in weight status, 4% in smoking, and 72% in sleeping.

As for the overall unhealthy lifestyle score, 1% of participants had a score of 0, indicating no unhealthy change in any of the behaviors. 10 % had 1 or 2 unhealthy behaviors and 90% had 3 or more unhealthy behaviors.

Table 3: Description of Eating habits and lifestyle changes during covid-19 pandemic among the study population (n = 413).

| | | n | % |
|--|------------|-----|----|
| Physical Activity | Increase | 56 | 14 |
| | Decrease | 221 | 54 |
| | Same | 136 | 33 |
| Food intake | Increase | 147 | 36 |
| | Decrease | 43 | 10 |
| | Same | 223 | 54 |
| Weight | Increase | 171 | 41 |
| | Decrease | 62 | 15 |
| | Same | 180 | 44 |
| Smoking | Increase | 9 | 2 |
| | Decrease | 9 | 2 |
| | Same | 17 | 4 |
| | Not smoker | 378 | 92 |
| Sleep | Increase | 33 | 8 |
| | Decrease | 80 | 19 |
| | Same | 300 | 72 |
| Unhealthy lifestyle and behavior score (mean ± SD: 2.89± 0.327) | 0 | 2 | 1 |
| | 1-2 | 41 | 10 |
| | ≥ 3 | 370 | 90 |

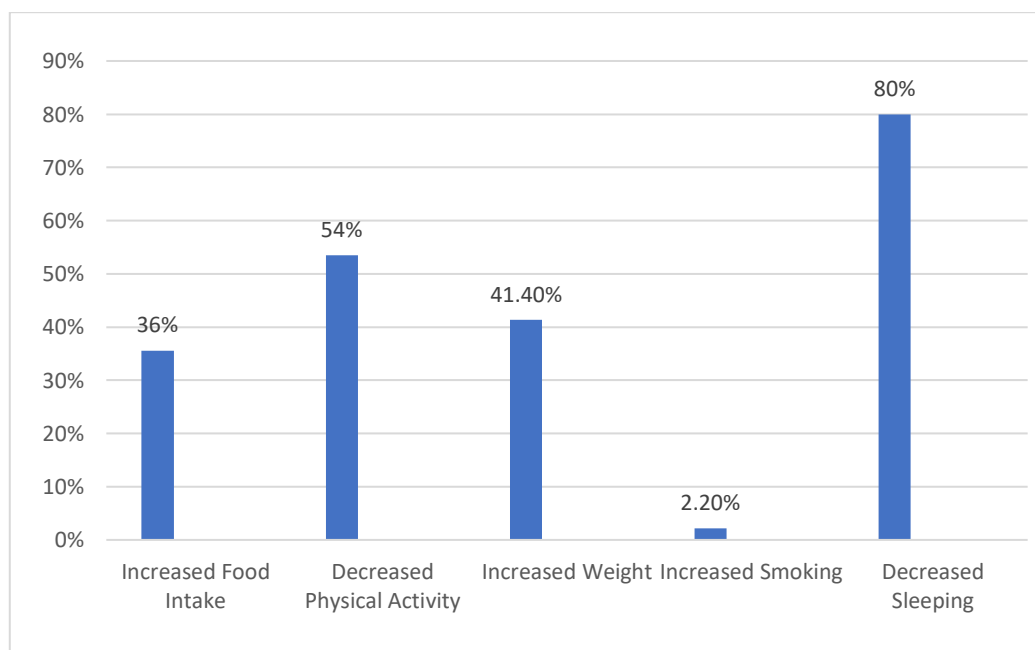


Figure 1: Prevalence of unhealthy lifestyle behaviors among study participants (n = 413)

The prevalence of each of the five unhealthy behaviors considered in this study is illustrated in **Figure 1**. Decreased sleeping was the most common, reported by 80%, followed by decreased physical

activity 54%, and increased weight 41.4%, and increased food intake and increased smoking were reported by 36% and 2.2%, respectively.

Description of Perception, health, and dietary practices and perceived mental health status related to COVID-19 among the study population were described in **Table 4**. When asked about their agreement on “Quarantine is a good way to protect my family and to stop the spread of infectious disease outbreaks”, 61% of the participants strongly agreed. 39% of the participants are sometimes encouraging their children to do physical activity. During covid-19 pandemic 61% were feeling more stressed. When asked what they did to relieve stress the majority reported they prayed (36%) or watched movies or listened to music (32 %) to relieve their stress. While the rest either ate more (13%), some exercised (10 %), or meditated (5%) to relieve stress. 40% have reported that their lifestyle behavior will improve after Covid-19 pandemic. With regards to dietary practices, 78% of the study participants were most consuming home cooked food, followed by fruits (59%), vegetables (52%), nuts (34%) and delivery food (31%) during COVID-19 pandemic. In contrast, more than 18 % from chips and crackers, cakes and pastries, fast food, and fried foods, sweets and herbal teas was mostly consumed during covid 19 pandemic. When asked about which foods that was increasingly consumed to prevent covid 19 pandemic, the majority they consumed fruits and vegetables 57%, followed by oranges 51%, citrus in general 48%, ginger 47%, lemon

41%, honey, turmeric and garlic 34%,33%, 31% respectively. 70% have the Perception that extra intake of vitamins and minerals can strengthen the body against COVID-19. 57% reported that they have increased their water intake to prevent covid-19 pandemic. 60% have used vitamin C, followed by 38% vitamin D supplementation to prevent covid-19 pandemic. When asked if they have started to drink herbal teas, 59% reported as “No”. on the other hand, 34% were using ginger as a herbal tea after covid-19 pandemic. 77% reported that consuming Citrus products is important to prevent Covid-19, therefore 50% have increased their citrus intake during covid-19 pandemic. 33% have reported that their source of information in taking herb/supplementation to prevent covid-19 was not consulting anybody. The proportion of going grocery shopping increased by 6% of the study population, and decreased for 3% while 51% reported no definite number of times of going grocery shopping. Almost 72% of the participants reported ordering food or groceries for delivery and 52 % sterilize food items when delivered. The most common ways reported to disinfect purchased fruits and vegetables were water only (42%), water and vinegar (16%) and water and salt (15%), water, vinegar, and salt (13%) whereas Water and Detergents (Dishwashing liquid) and Disinfectants for vegetables and fruits 6%,7% respectively were used.

Table 4: Description of, perception, health and dietary practices, and perceived mental health status related to COVID-19 among the study population (n= 413)

| | | n | % |
|--|--|-----|----|
| Lifestyle | | | |
| Agreement on “Quarantine is a good way to protect my family and to stop the spread of infectious disease outbreaks “ | Strongly agree | 252 | 61 |
| | Agree | 154 | 37 |
| | Disagree | 7 | 2 |
| Encouraging children to do physical activity | Yes, everyday | 123 | 30 |
| | Yes, sometimes | 161 | 39 |
| | No | 19 | 5 |
| | I don't have children at home | 66 | 16 |
| | Not applicable | 44 | 11 |
| Feeling more stressed during Covid-19 pandemic | Yes | 251 | 61 |
| | No | 95 | 23 |
| | Maybe | 67 | 16 |
| Ways to relieve the stress during Covid-19 pandemic | Eat more | 55 | 13 |
| | Meditate | 21 | 5 |
| | Pray | 150 | 36 |
| | Watch movies or listen to music | 133 | 32 |
| | Exercise more | 41 | 10 |
| | Other | 12 | 3 |
| After Covid-19 pandemic lifestyle | Improve | 199 | 48 |
| | Don't know if it will change | 136 | 33 |
| | Stays the same | 78 | 19 |
| Dietary Habits | | | |
| Food items consumed the most during COVID-19 pandemic | Fruits | 244 | 59 |
| | Vegetables | 215 | 52 |
| | Home Cooked food | 321 | 78 |
| | Delivery food | 128 | 31 |
| | Fried foods | 81 | 20 |
| | Cakes and pastries | 76 | 18 |
| | Chips and crackers | 96 | 23 |
| | fast food | 77 | 19 |
| | Nuts | 139 | 34 |
| | Sweets | 84 | 20 |
| | Herbal Tea | 84 | 20 |
| | None | 5 | 1 |
| Type of food consumed more of during Covid-19 pandemic | Salty Snacks: chips, popcorn, crackers etc. | 45 | 11 |
| | Sweet snacks: Cupcakes, cookies, cakes, etc. | 47 | 11 |

| | | | |
|--|----------------------------|-----|----|
| | Cooked food | 308 | 75 |
| | Nothing | 13 | 3 |
| Foods increased to prevent Covid-19 pandemic | Chicken | 79 | 19 |
| | Chicken Soup | 33 | 8 |
| | Fruits and vegetables | 235 | 57 |
| | Citrus (in general) | 200 | 48 |
| | Oranges | 209 | 51 |
| | Lemon | 170 | 41 |
| | Grapefruit | 31 | 8 |
| | Pomegranate | 47 | 11 |
| | Beets | 23 | 6 |
| | Carrots | 71 | 17 |
| | Garlic | 128 | 31 |
| | Onion | 86 | 21 |
| | Date | 66 | 16 |
| | Ginger | 196 | 47 |
| | Turmeric | 136 | 33 |
| | Cinnamon | 59 | 14 |
| | Black Seeds | 42 | 10 |
| | Thyme | 22 | 5 |
| | Honey | 142 | 34 |
| | Walnuts, almonds and seeds | 112 | 27 |
| Perception of extra intake of vitamins and minerals can strengthen the body against COVID-19 | Yes | 288 | 70 |
| | No | 40 | 10 |
| | Maybe | 85 | 21 |
| Increase of water intake to prevent Covid-19 pandemic | Yes | 237 | 57 |
| | No | 49 | 12 |
| | Did not change | 127 | 31 |
| Supplement used to prevent Covid-19 pandemic | Vitamin C | 247 | 60 |
| | Vitamin D | 156 | 38 |
| | Folic Acid | 17 | 4 |
| | Zinc | 69 | 17 |
| | Calcium | 32 | 8 |
| | Omega 3 | 45 | 11 |
| | B complex | 26 | 6 |
| | Probiotic | 14 | 3 |
| | Protein Supplements | 16 | 4 |
| Supplement used to prevent Covid-19 pandemic | Vitamin C | 247 | 60 |
| | Vitamin D | 156 | 38 |
| | Folic Acid | 17 | 4 |
| | Zinc | 69 | 17 |
| | Calcium | 32 | 8 |
| | Omega 3 | 45 | 11 |
| | B complex | 26 | 6 |
| | Probiotic | 14 | 3 |
| | Protein Supplements | 16 | 4 |
| Starting to drink herbal teas during covid-19 pandemic | Yes | 169 | 41 |
| | No | 244 | 59 |
| Herbal teas used after covid-19 | Thyme | 25 | 6 |
| | Mixed Herbal | 54 | 13 |
| | Cinnamon | 41 | 10 |
| | Chamomile | 42 | 10 |
| | Green tea | 125 | 30 |
| | Ginger | 140 | 34 |
| | I don't drink herbal teas | 167 | 40 |
| Perception of consuming Citrus products is important to prevent Covid-19 | Yes | 317 | 77 |
| | No | 34 | 8 |
| | I don't know | 62 | 15 |
| Increase of Citrus intake during Covid-19 pandemic | Yes, I increased it | 206 | 50 |
| | No, it hasn't changed | 105 | 25 |
| | Slightly increased | 102 | 25 |

| | | | |
|---|---|-----|----|
| Source of information that taking herb/supplement prevent or treat Covid-19 | Social media | 73 | 18 |
| | TV and Radio | 12 | 3 |
| | Health practitioner | 98 | 24 |
| | Family and friends | 88 | 21 |
| | Did not consult anybody | 138 | 33 |
| | Others | 4 | 1 |
| Healthy Practices | | | |
| During Covid-19 pandemic ordering food or groceries for delivery | Yes | 298 | 72 |
| | No | 115 | 28 |
| Number of times went grocery shopping per week before COVID-19 lockdown | 1 time/week | 153 | 37 |
| | 2 times/week | 94 | 23 |
| | 3 times or more/week | 56 | 14 |
| | No definite time | 110 | 27 |
| Number of times went grocery shopping per week during COVID-19 lockdown | 1 time/week | 168 | 41 |
| | 2 times/week | 100 | 24 |
| | 3 times or more/week | 45 | 11 |
| | No definite time | 100 | 24 |
| Dietary Ways to disinfect purchased fruits and vegetables | Water | 174 | 42 |
| | Vinegar | 3 | 1 |
| | Water + vinegar | 66 | 16 |
| | Water + salt | 60 | 15 |
| | Water + vinegar + salt | 55 | 13 |
| | Water + Detergents (Dishwashing liquid) | 23 | 6 |
| | Disinfectants for vegetables and fruits | 27 | 7 |
| | Other | 5 | 1 |
| Sterilizing food items when delivered | Yes | 216 | 52 |
| | No | 197 | 48 |

Table 5: Gender

| | Males | Females | p-value |
|--|-----------|------------|---------|
| Total | 75 | 338 | |
| Change in weight during lockdown | | | |
| Decrease n (%) 0 | 14 (18.7) | 48 (14.2) | 0.327 |
| Increase /No change n (%) 1 | 61 (81.3) | 290 (85.8) | |
| Change in physical activity during lockdown | | | |
| Decrease n (%) 1 | 58 (77.3) | 299 (88.5) | 0.011 |
| Increase /No change n (%) 0 | 17 (22.7) | 39 (11.5) | |
| Change in smoking habit during lockdown | | | |
| Decrease n (%) 0 | 63 (84) | 318 (94.1) | 0.003 |
| Increase /No change n (%) 1 | 12 (16) | 20 (5.9) | |
| Change in Food intake during lockdown | | | |
| Decrease n (%) 0 | 11 (14.7) | 32 (9.5) | 0.182 |
| Increase /No change n (%) 1 | 64 (85.3) | 306 (90.5) | |

Table 6: Marital Statues

| | Married | Others | p-value |
|--|------------|-----------|---------|
| Total | 326 | 87 | |
| Change in weight during lockdown | | | |
| Decrease n (%) 0 | 47 (14.4) | 15 (17.2) | 0.512 |
| Increase /No change n (%) 1 | 279 (85.6) | 72 (82.8) | |
| Change in physical activity during lockdown | | | |
| Decrease n (%) 1 | 281 (86.2) | 76 (87.4) | 0.779 |
| Increase /No change n (%) 0 | 45 (13.8) | 11(12.6) | |
| Change in smoking habit during lockdown | | | |
| Decrease n (%) 0 | 307 (94.2) | 74 (85.1) | 0.005 |
| Increase /No change n (%) 1 | 19 (5.8) | 13 (14.9) | |
| Change in Food intake during lockdown | | | |
| Decrease n (%) 0 | 32 (9.8) | 11 (12.6) | 0.443 |
| Increase /No change n (%) 1 | 294 (90.2) | 76 (87.4) | |

Table 7: Nationality

| | Local | Nonlocal | p-value |
|--|-----------|------------|---------|
| Total | 92 | 321 | |
| Change in weight during lockdown | | | |
| Decrease n (%) 0 | 10 (10.9) | 52 (16.2) | 0.207 |
| Increase /No change n (%) 1 | 82 (89.1) | 269 (83.8) | |
| Change in physical activity during lockdown | | | |
| Decrease n (%) 1 | 79 (85.9) | 278 (86.6) | 0.856 |
| Increase /No change n (%) 0 | 13(14.1) | 43 (13.4) | |
| Change in smoking habit during lockdown | | | |
| Decrease n (%) 0 | 86 (93.5) | 295 (91.9) | 0.618 |
| Increase /No change n (%) 1 | 6 (6.5) | 26 (8.1) | |
| Change in food intake during lockdown | | | |
| Decrease n (%) 0 | 7 (7.6) | 36 (11.2) | 0.318 |
| Increase /No change n (%) 1 | 85 (92.4) | 285 (88.8) | |

Table 5,6,7 The analysis examines behavioral changes during lockdown across gender, marital status, and nationality. Among genders, females were more likely to experience a decrease in physical activity (88.5% vs. 77.3%) and smoking habits (94.1% vs. 84%) compared to males, with statistically significant differences ($p = 0.011$ and $p = 0.003$, respectively), while changes in weight and food intake showed no significant differences. Regarding marital status, married individuals were more likely to reduce smoking habits (94.2% vs. 85.1%, $p = 0.005$) compared to non-married individuals, with no meaningful differences in weight, physical activity, or food intake. For nationality, no statistically significant differences were observed, though nonlocal individuals showed slightly higher decreases in weight and food intake compared to locals. These findings highlight specific patterns of behavioral changes influenced by demographic factors during lockdown, with significant trends primarily in physical activity and smoking habits.

Results Conclusion and recommendations

The COVID-19 pandemic and subsequent lockdown led to significant lifestyle changes among healthcare professionals in Dubai, with a high prevalence of unhealthy behaviors. Increased dietary intake, weight gain, decreased physical activity, smoking, and poor sleep were common, with 90% of participants reporting three or more unhealthy lifestyle changes. Female healthcare professionals, those living in apartments, and individuals who were overweight or obese were more likely to experience these negative shifts. Additionally, over half of the participants reported increased stress levels during lockdown, a concerning trend in a country like the UAE, where non-communicable diseases (NCDs) pose a major public health challenge.

Given their critical role in combating pandemics, healthcare professionals across all categories within the Dubai Health must be encouraged to adopt healthier lifestyles. Targeted interventions should focus on promoting balanced diets, regular physical activity, smoking cessation, and mental health support. Developing wellness programs and policies to mitigate the long-term effects of lockdown-related lifestyle changes is essential. Future research should explore the socioeconomic factors influencing these behaviors and assess the long-term impact of the pandemic on healthcare workers' well-being. Follow-up studies will be crucial in shaping effective strategies to enhance resilience and overall health in the post-pandemic era.

Discussion

The COVID-19 pandemic significantly impacted healthcare workers worldwide, influencing their lifestyle, diet, and overall well-being. This study examines the extent of these changes among healthcare professionals in Dubai, highlighting both unhealthy lifestyle shifts and positive dietary adaptations. The findings reflect a complex interplay between stress-induced behaviors and health-conscious decisions, aligning with global research on pandemic-related lifestyle changes (Cheikh Ismail et al., 2020; Radwan et al., 2020).

Unhealthy Lifestyle Changes

A striking 90% of participants reported three or more unhealthy lifestyle changes, including reduced physical activity (54%), irregular sleep patterns (72%), and increased food intake (36%). These disruptions were largely driven by mobility restrictions, higher work demands, and pandemic-related stress. Similar trends have been observed in international studies (Gornicka et al., 2020; Dunton et al., 2020), reinforcing the widespread nature of these lifestyle shifts. Notably, sleep disturbances were among the most frequently reported issues (71%), closely linked to increased stress and shift work (Dunton et al., 2020). The cyclical relationship between stress, sleep deprivation, and weight gain further exacerbates health risks, particularly among frontline workers (Di Renzo et al., 2020).

Dietary Adjustments

Despite an increase in emotional eating and portion sizes, the study also revealed positive dietary changes. Most participants consumed more home-cooked meals (78%), along with higher intakes of fruits (59%) and vegetables (52%). These findings suggest a greater awareness of nutrition's role in immunity and health, aligning with previous research (Cheikh Ismail et al., 2020; Radwan et al., 2020). The shift towards home-prepared meals may be attributed to restaurant closures and an increased focus on meal quality. However, stress-driven food consumption remains a concern, as it highlights the dual impact of the pandemic—some individuals sought comfort in food, while others used it as a means to improve their health (Di Renzo et al., 2020).

Stress and Mental Health

Stress emerged as a major factor, with 61% of participants reporting increased stress levels during the pandemic. Religious and spiritual activities, such as prayer (36%), were common coping mechanisms, followed by passive leisure activities like watching movies or listening to music (32%). A smaller proportion resorted to increased food consumption (13%) for stress relief. These findings are consistent with global research on the psychological toll of the pandemic on healthcare workers (Gornicka et al., 2020; Dunton et

al., 2020), who faced heavy workloads, infection risks, and isolation from loved ones. The link between stress, poor sleep, and unhealthy dietary habits underscores the urgent need for targeted mental health interventions within the healthcare sector (Radwan et al., 2020).

Gender-Specific Observations

Female healthcare professionals experienced greater lifestyle disruptions than their male counterparts, particularly in physical activity reduction and increased food intake. This aligns with existing literature, which suggests that women bear a higher emotional burden during crises due to caregiving responsibilities and social expectations (Cheikh Ismail et al., 2020). The findings highlight the need for gender-sensitive support strategies to help female healthcare workers maintain a balanced lifestyle during public health emergencies (Radwan et al., 2020).

Impact of Living Environment

The study also identified differences based on living arrangements, with 71% of apartment dwellers reporting greater difficulty in maintaining a balanced lifestyle compared to those living in houses with gardens. Restricted access to outdoor spaces likely contributed to lower physical activity levels, mirroring findings from other research on the environmental impact of mobility constraints during lockdowns (Di Renzo et al., 2020).

Global Comparisons

The results of this study align with international research on pandemic-related lifestyle changes. Similar patterns of increased food intake and weight gain have been documented in the UAE (Radwan et al., 2020), Poland (Gornicka et al., 2020), and Italy (Di Renzo et al., 2020), highlighting the global reach of these behavioral shifts. However, this study uniquely focuses on healthcare professionals, a population often overlooked in pandemic lifestyle research. The findings reinforce the concept of a “Janus-faced” pandemic, where stress-induced behaviors coexist with health-oriented adaptations, demonstrating both the vulnerabilities and resilience of healthcare workers during crises (Cheikh Ismail et al., 2020).

Strengths and Limitations

A key strength of this study is its focus on healthcare professionals, a demographic that has been largely overlooked in pandemic-related lifestyle research. The study benefits from a robust sample size of 413 participants, encompassing a diverse range of healthcare specialties, which enhances the generalizability of the findings.

However, certain methodological limitations should be acknowledged. The reliance on self-reported data introduces the potential for response bias, as participants may over- or under-report their behaviors. Additionally, the cross-sectional research design limits the ability to establish causality or discern temporal changes in lifestyle behaviors.

Future research should investigate the long-term effects of the COVID-19 pandemic on the lifestyle behaviors of healthcare professionals, with particular attention to the influence of socioeconomic factors. Comparative studies across different cultural and national healthcare systems may also provide valuable insights into the broader implications of these lifestyle changes.

Recommendations

1. Mental Health Support

Healthcare facilities should implement comprehensive workplace stress management programs. These should include professional counseling services, stress coping strategies, and relaxation techniques to support employees’ psychological well-being.

2. Promotion of Physical Activity

Institutions should facilitate access to physical exercise by organizing virtual fitness programs and providing online resources to encourage healthcare workers to maintain an active lifestyle, particularly during periods of restricted mobility.

3. Reinforcement of Positive Dietary Changes

Public health initiatives should promote the production and consumption of nutritious, balanced meals, leveraging the recent trend towards home-prepared foods to encourage sustainable and healthy eating habits.

4. Targeted Interventions for Women

Policymakers should develop gender-sensitive policies and support mechanisms that address the unique challenges faced by female healthcare workers, particularly those balancing professional responsibilities with caregiving roles.

5. Environmental Modifications

Urban planning initiatives should prioritize the expansion of green spaces and recreational facilities to support the physical and psychological well-being of healthcare professionals and the general public, particularly during public health emergencies.

Table 8: Key Implications

| Key Implications | Percentage | Observed Change | Lifestyle Aspect |
|--|------------|------------------------------------|---------------------------|
| Limited mobility and increased workloads reduced physical activity levels. | 54% | Decrease | Physical Activity |
| Stress-induced eating and irregular schedules contributed to higher food consumption. | 36% | Increase | Food Intake |
| Weight gain reflects a combination of reduced activity and increased food intake. | 41% | Increase | Weight Status |
| Stress and irregular routines severely impacted sleep patterns. | 72% | Disruption (poor quality/decrease) | Sleep Patterns |
| Stress was a key driver of other lifestyle changes, highlighting the need for mental health support. | 61% | Increase | Stress Levels |
| Reflects heightened health awareness among healthcare professionals. | 78% | Increased home-cooked meals | Dietary Practices |
| Limited space for activity and recreation amplified lifestyle challenges. | 71% | Apartments exacerbated disruptions | Living Environment Impact |
| Highlights the need for gender-sensitive interventions and policies. | - | Women disproportionately affected | Gender Differences |

Declarations

Ethical Approval and Consent to participate

Recruitment and data collection for this study were approved by the Dubai Health Authority Ethics Committee through the Dubai Scientific Research Ethics Committee (DSREC). The reference number for approval is DSREC-05/2021_02. Each participant signed an informed consent form that allowed them to participate in the survey. Everyone was offered an opt-out option, and no personal data identifying the subjects was gathered to reduce participant risk and generalization. Participation in the study was voluntary, and the study complied with the principles of the Declaration of Helsinki for human research.

Consent for publication

Not Applicable

Availability of supporting data

Available on corresponding author upon a responsible request.

Competing interests

There are no competing interests

Funding Statement

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