Lifestyle changes of attendees at primary health care centers during the COVID-19 pandemic in Qassim Province, Saudi Arabia

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ABSTRACT

Background: The COVID-19 pandemic has affected many individuals in the past year through increased mortality, morbidity, and economic disturbances while also affecting individual lifestyles. Healthy lifestyle practices can reduce mortality and morbidity and improve quality of life. We aimed to identify daily lifestyle changes during the COVID-19 pandemic. To do so, we examined factors related to family, livelihood, and other associated changes. Methodology: A cross-sectional study was conducted among attendees visiting selected primary health care centers of Qassim province. The data was collected through direct interview method, and 365 individuals participated during the study period. Data was entered in SPSS version 21.0, and necessary statistical tests were applied. Results: Out of 365 individuals, 27.4% were male and 72.6% were female. There was a drastic decrease in the frequency of in-person shopping (74.2%) and a steep increase in online shopping (41.4%). The mean weight increase was 4.5 (SD = 3.09) kg. Telemedicine use was 43.6%. There was a statistically significant association found between male gender and fear about COVID-19 (P = 0.019). Conclusions: We noticed adverse lifestyle changes in the study population during the COVID-19 pandemic. Health promotional measures and lifestyle modifications are still required to combat COVID-19.

Keywords: Fear about COVID-19, lifestyle changes, social gatherings

Introduction

For more than a year throughout the world, there have been social and economic disturbances among families, businesses, and national economies due to many problems related to COVID-19. As of July 13, 2021, 96.3% of those who contracted COVID-19 in the Kingdom of Saudi Arabia had recovered and its numbers are dynamic.[1] A study conducted among 3533 participants in Italy on lifestyle changes during the COVID-19 lockdown found that weight gain was observed in 48.6% of the study population.[2] Another study done on lifestyle behaviors during the COVID-19 pandemic by Balanzá-Martínez et al.[3] at the University of Valencia stated that lifestyle changes such as excessive diet, lack of exercise, increased tobacco use, and mental disorders were associated with increased COVID-19 mortality.

Adopting simple, healthy lifestyle practices in daily routines reduces mortality and morbidity patterns and improves quality of life. Unhealthy lifestyle behaviors such as poor diet quality, lack of exercise, smoking, and stress can lead to an increased burden on the community and country.[4-6]

Prolonged lockdown and staying at home for longer periods affect daily wages, which may affect livelihoods. During this crisis

Keywords: Fear about COVID-19, lifestyle changes, social gatherings

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management, people may experience psychological disturbances, such as anxiety or depression. For individuals to take care of their own health and also take care of their dependents, they need to adopt good lifestyle changes around the house that will help them overcome the uncertainty of the COVID-19 pandemic.  

Hearing or reading continuously about COVID-19 from the media can be stressful, which also leads individuals toward overeating, especially "comfort foods" rich in sugar. Under such circumstances, individuals may experience adverse effects on their health, such as weight gain. Motivation to practice good lifestyle modifications is one way to help individuals become healthy.  

In view of the abovementioned circumstances and practices, we aimed to identify the present status of lifestyle modifications during the COVID-19 pandemic among attendees at primary health care centers (PHCCs) and determine what demographic characteristics and other factors were associated with those changes. Ultimately, we plan to educate the patients at PHCCs in the areas of mask application and other preventive measures, as well as regular prescription of treatment and care.  

Materials and Methods  

A cross-sectional study was conducted among the population aged 18 years and older attending PHCCs in Qassim province.  

Questionnaire and data collection  

The questionnaire consisted of two parts included as demographic profile variables and specific lifestyle changes. Some of the definitions were adopted from previous studies, and other working definitions were included.  

Physical activity/exercise was defined as any bodily movement produced by skeletal muscles that results in energy expenditure, such as walking, going to the gym, and playing sports. Smoking was defined as the act of inhaling and exhaling the fumes of burning plant material, but the act is most commonly associated with tobacco as smoked in a cigarette. Online shopping, also known as e-shopping or Internet shopping, was used to refer to a channel through which consumers can do their shopping activities over the Internet. A social gathering can be defined as a gathering at one place in small, medium, or large groups, but in our study, a social gathering was defined as more than 20 people in one place. The COVID-19 outcome included those infected with COVID-19 after some time with or without treatment; a person may have died or recovered (partially or completely) from the COVID-19 disease. Financial difficulty was defined as an inability to provide for the regular activities of the family (food and other family needs) within the monthly income during the COVID-19 pandemic. Social distancing was defined as a person maintaining a distance of 2 m from another person in public spaces, such as when shopping at a store.  

Sample size and sampling method  

The sample size was calculated using the OpenEpi sample size calculator. The population of Qassim province was 1370727 as of 2020, and the prevalence taken for sample size calculation was 50% with a 95% confidence interval and a design effect of 1. Based on the above parameters, the sample size estimate was 385. In Qassim province, the cities of Buraidah, Unaizah, and AlRass together comprise 80% of the total population of Qassim. In each city, 10% of PHCCs were included in our study. Data were collected from patients attending 10 PHCCs of Qassim province (5 PHCCs from Buraidah, 3 from Unaizah, and 2 from AlRass) by simple random method. Data collectors were doctors at the level of specialist and above and received a one-day orientation. Simultaneously, among the 10 PHCCs, an average of 20 attendees were selected every day and interviewed. The same procedure was applied until the required study sample was complete. The study lasted six months, from September 2020 through February 2021.  

Ethical considerations  

Confidentiality of the patient information was maintained, and informed consent was taken from every patient. Before starting the study, an approval letter from the Primary Health Care (PHC) director was also received.  

Statistical analysis  

The data were entered in SPSS version 21.0. Frequency, percentages, and means of variables were calculated from the descriptive data. For categorical analysis, the Chi-square test was applied. For continuous variables and categories of lifestyle changes, an analysis of variance (ANOVA) test was applied. The level of significance was set as \( P \leq 0.05 \). For the moderation of factors, such as the dependent variable of depression versus independent variables of social distance and fear about COVID-19, we used the process procedure in SPSS version 3.5.3 written by Andrew F. Hayes (available at www.afhayes.com).  

Results  

A total of 365 individuals participated in the study. Males comprised 27.4% of the participants, and females comprised 72.6% of the participants. In the study population, the mean age was 38.62 \( \pm 13.07 \) SD). The median age of the study population was 36 years. The response rate was 94.8%. Unemployed people, including housewives, comprised 51% of participants. In the study population, approximately 38.1% had completed school [Table 1]. The overall prevalence of depression in the study population was 27.1%. In the study group, responses of "yes" to variables of fear about COVID-19, COVID-19 outcome, and COVID-19 death were 52.1%, 48.5%, and 43.6%, respectively. A statistically significant association was observed between male gender and fear about COVID-19 in the study population (\( P = 0.019 \)).
In the present study, approximately 31.8% of participants were sleeping less than 6 hours a night and 58.9% were engaging in physical activities. Approximately 49.3% reported a change in weight (either increased or decreased), and the mean weight increase reported was 4.5 (SD = 3.09) kg. Approximately 74.2% of participants reported a change in the in-person frequency of shopping [Table 2].

During the COVID-19 pandemic, approximately 54.8% of participants responded that they had increased time spent with family, and 68.2% responded that they met with elderly people less frequently. Approximately 86.6% of participants responded that social gatherings had decreased, and 76.7% had decreased visits to parks [Table 3].

Approximately 72.6% of participants were following social distancing measures at all times when leaving their house, and 73.4% wore masks when leaving their house. Approximately 43.6% of participants were using telemedicine during the COVID-19 pandemic [Table 4].

In this study, approximately 71% reported no financial difficulties during the COVID-19 period. Expenditure in the family decreased for 48.2% of participants. Among the male gender, 81% practiced social distancing, whereas among the female gender, 67.9% practiced social distancing. Males were significantly associated with practicing social distancing during the COVID-19 pandemic ($P = 0.048$). When the ANOVA test was applied, there was a statistically significant difference observed between the mean age and social distancing ($F = 3.747; CI = 1.17–15.68; P = 0.025$). A significant difference was observed between the categories of practicing social distancing at all times (mean age = 39.22) and not practicing social distancing (mean age = 30.79).

In the case of shaking hands, 27% of males shook hands, and 38.5% of females shook hands. There was a statistically significant association observed between females and the frequency of shaking hands ($P = 0.001$) [Table 5].

Among people who reported an increase in online shopping, 63.6% reported weight gain, which was statistically significant ($P = 0.001$). Financial difficulty was reported more by private employees (38%), whereas financial difficulty was reported by 22.5% of government employees. Among those who had a fear of COVID-19, 35.7% reported depression, and among people without fear of COVID-19, the depression level was 18.3% and was statistically significant ($P = 0.001$). Telemedicine was used during the COVID-19 pandemic by 46% of females, whereas 37% of males reported using telemedicine. The percent of unemployment was higher among females (62.3%) than among males (21%). Fear about COVID-19 was reported by 62% of males, whereas 48.3% of females reported a fear about COVID-19. There was a statistically significant association observed between the male gender and fear about COVID-19 ($P = 0.019$) [Table 6]. Figure 1 shows that social distancing (2 m) lessened depression.

### Discussion

Very few studies conducted outside Saudi Arabia have dealt with lifestyle changes during the COVID-19 pandemic. To our knowledge, as per the literature review, this is the first community-based study in Saudi Arabia in relation to lifestyle changes during the COVID-19 pandemic.

In the current study, approximately 58.9% of participants engaged in exercise before the COVID-19 pandemic. In the midst of the...
In the current study, only 6.6% of participants reported smoking. Of those, 21.1% responded that they smoked more frequently. Studies have shown that as smoking increases, the risk of developing severe symptoms of COVID-19 increases along with the risk of an admitted patient’s mortality.[18] A study done by Zhao et al.[19] showed that there was a significant relationship between smoking and the severity of COVID-19, (OR: 2.0; 95% CI = 1.3–3.1) and stated that mortality increased twofold with increased smoking. Other studies mentioned that as smoking increases, the increased cardiovascular risk also affects COVID-19 mortality.[20] One of the limitations of our study is that smoking quantity and ex-smoker status was not examined. Additionally, lockdown and longer periods at home could be a reason to have less smoking prevalence.

Approximately 49.3% of participants responded that they observed a change in weight. Of those, 64.4% reported that their weight had increased. In our study, the mean weight increase of the study population was 4.5 kg. Women who gained weight reported an average increase of 2.8 kg. Lockdown and prolonged periods at home, along with the closure of recreation facilities and gyms, are factors in the tendency to gain weight. Other factors for increased weight gain were not explored in our study. However, López-Moreno et al.[16] conducted a study (n = 675) and stated that 38.8% of respondents experienced weight gain during confinement while 31.1% lost weight. A study done by Drywień et al.[21] in Poland during the COVID-19 pandemic revealed that 34% of women gained weight and 18% of women reduced weight.

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During the COVID-19 pandemic, approximately three-fourths of the study participants reported visiting parks less frequently, approximately two-thirds of the participants reported meeting
their elderly parents less frequently, and 87% of participants reported that social gatherings also decreased. In March 2020, the Saudi authorities announced the closure of all amusement parks and entertainment zones in malls and the banning of all social events, including weddings. Alternatively, the government provided necessary support in the interest of the public to maintain a normal quality of life. Thereafter, the subsequent resumption of activities to promote normal life encouraged the population to adopt recreation activities, including visiting parks, provided that they adopted necessary preventive measures like mask application and social distancing.

In the current study, approximately 29% of participants expressed financial difficulties during the COVID-19 pandemic. Nurunnabi et al. conducted a study in April 2020 that revealed that many of the businesses located in Riyadh (27%) and Qassim province (30%) were negatively affected by the pandemic. During this period, the Saudi government took great initiatives to help private employees overcome the COVID-19 crisis, and some financial stimulus packages were provided to private companies to safeguard their workers.

Approximately 73.4% of the participants reported that they wore a mask when they go out; 22.5% reported wearing a mask sometimes, and 4% reported not wearing a mask because they assumed COVID-19 cases were decreasing at the time of data collection. Approximately 88% of males and 67.9% of females wore a mask when going outside. The difference could be due to the cultural practice of wearing hijab among females. Studies have shown that a mixture of self-enforced approaches can be undertaken more readily rather than prevention through isolation.

Social distancing and hand washing are useful strategies that are

### Table 5: Gender in Relation to Lifestyle Parameters of COVID-19 Preventive Measures

| Social distancing | All the time | Sometimes | Not at all | Total |
|-------------------|-------------|-----------|-----------|-------|
| Male              | 81 (81%)    | 17 (17%)  | 2 (2%)    | 100 (100%) |
| Female            | 184 (67.9%) | 64 (24.2%)| 17 (6.4%) | 265 (100%) |
| Total             | 265 (72.6%) | 81 (22.2%)| 19 (5.2%) | 365 (100%) |

χ² = 15.04, df = 2, P = 0.001

Wearing a mask

|                | All the time | Sometimes | Not at all | Total |
|----------------|-------------|-----------|-----------|-------|
| Male           | 88 (88%)    | 10 (10%)  | 2 (2%)    | 100 (100%) |
| Female         | 180 (67.9%) | 72 (27.2%)| 13 (4.9%) | 265 (100%) |
| Total          | 268 (73.4%) | 82 (22.2%)| 15 (4.1%) | 365 (100%) |

χ² = 15.04, df = 2, P = 0.001

Shaking hands

|                | All the time | Sometimes | Not at all | Total |
|----------------|-------------|-----------|-----------|-------|
| Male           | 27 (27%)    | 18 (18%)  | 55 (55%)  | 100 (100%) |
| Female         | 102 (38.5%) | 65 (24.5%)| 98 (37%)  | 265 (100%) |
| Total          | 129 (35.3%) | 83 (22.7%)| 153 (41.9%) | 365 (100%) |

χ² = 9.69, df = 2, P = 0.008

### Table 6: Variables Associated with Lifestyle Factors During the COVID-19 Pandemic

| Online shopping | Weight gain | No weight gain | Total |
|-----------------|-------------|----------------|-------|
| Increased       | 96 (63.6%)  | 55 (36.4%)     | 151 (100%) |
| Decreased       | 27 (33.3%)  | 54 (66.7%)     | 81 (100%) |
| No Change       | 57 (42.9%)  | 76 (57.1%)     | 133 (100%) |
| Total           | 180 (49.3%) | 185 (50.7%)    | 365 (100%) |

χ² = 22.78, df = 2, P < 0.001

| Occupation      | Financial difficulty | No financial difficulty | Total |
|-----------------|----------------------|-------------------------|-------|
| Unemployed      | 58 (31.2%)           | 128 (68.8%)             | 186 (100%) |
| Government employee | 29 (22.5%)         | 100 (77.5%)             | 129 (100%) |
| Private employee | 19 (38%)             | 31 (62%)                | 50 (100%) |
| Total           | 106 (29%)            | 259 (71%)               | 365 (100%) |

χ² = 13.05, df = 2, P = 0.001

| Covid positive  | Depression absent | Depression present | Total |
|-----------------|-------------------|--------------------|-------|
| Fear covid +Ve  | 123 (64.7%)       | 67 (35.3%)         | 190 (100%) |
| Do not fear covid +Ve | 143 (81.7%)  | 32 (18.3%)         | 175 (100%) |
| Total           | 266 (72.9%)       | 99 (27.1%)         | 365 (100%) |

χ² = 11.32, df = 1, P < 0.001

| Gender | Telemedicine not used | Telemedicine used | Total |
|--------|-----------------------|-------------------|-------|
| Male   | 63 (63%)              | 37 (37%)          | 100 (100%) |
| Female | 143 (54%)             | 122 (46%)         | 265 (100%) |
| Total  | 206 (56.4%)           | 159 (43.6%)       | 365 (100%) |

χ² = 21.41, df = 1, P < 0.001; OR = 2.41; CI = 0.608-1.104

| Gender   | Unemployed | Govt. employee | Private employee |
|----------|------------|----------------|------------------|
| Male     | 21 (21%)   | 62 (62%)       | 17 (17%)         |
| Female   | 165 (62.3%)| 67 (25.3%)     | 33 (12.5%)       |
| Total    | 186 (51%)  | 129 (35.3%)    | 50 (13.7%)       |

χ² = 53.04, df = 2, P < 0.001

| Gender   | No fear about COVID-19 | Fear about COVID-19 | Total |
|----------|------------------------|---------------------|-------|
| Male     | 38 (38%)               | 62 (62.0%)          | 100 (100%) |
| Female   | 137 (51.7%)            | 128 (48.3%)         | 265 (100%) |
| Total    | 175 (47.9%)            | 190 (52.1%)         | 365 (100%) |

χ² = 54.45, df = 1, P < 0.001; OR = 1.891; CI = 1.091-2.795
well agreed upon by most people; however, the significance of wearing face masks cannot be ignored.[24,25]

There has been a continuing debate on whether it is necessary for common people to wear face masks. However, the effectiveness of face masks has been recognized as the best preventive measure where there is a respiratory origin as the mode of transmission of a disease, both in the preceding outbreaks of SARS and influenza.[25] While preventing the spread of aerosols through the air, face masks might also reduce regular contact between the hand and nose/face.[26]

In November 2020, with regard to social distancing during the COVID-19 pandemic, approximately 72.6% of participants followed social distancing measures at all times, 22.2% followed social distancing measures sometimes, and 5% did not follow the measures. During data collection period, COVID-19 disease magnitude is less in Qassim province, that could be the reason to use less masking and social distancing measures.

In a study conducted in the United States of America (USA) among people 18 years and older, approximately two-thirds of participants (65.0%) reported practicing more social distancing (staying more than 6 feet away from others) compared to before the COVID-19 outbreak. There were no statistically significant differences in social distancing behaviors by gender, urban area, and income.[28‑30] In the current study, there was a statistically significant association observed between the male gender and practicing social distancing at all times (males: 81%; females: 67.9%; $P = 0.049$).

In the present study, 43.6% of participants reported using telemedicine. Before the COVID-19 pandemic, the telemedicine practice in our province as well as globally was relatively less. Among females, 46% reported using more telemedicine during the COVID-19 pandemic, whereas 37% of males reported doing so. The Ministry of Health introduced many mobile applications, including the 937 mobile number, to avail telemedicine services to the general population. Another public health study done by Alshammari et al. in Saudi Arabia revealed that approximately 51% of participants were satisfied with the current mobile applications and telemedicine services.[28‑30] However, in the USA, most telehealth patients (93%) sought care for conditions other than COVID-19. There was a 154% increase in use observed in March 2020 compared with February 2019[31] and another study reported a decline in telemedicine.[32]

In our study, we set depression screening criteria (PHQ-2) as those who were experiencing a loss of interest and low mood. Overall, depression in the study during the COVID-19 pandemic was 27.1%. Among people who had fear about COVID-19, the depression prevalence was 35.3% and was statistically significant ($P = 0.001$).

A study done by Alamri et al.[33,34] in Saudi Arabia stated that among 1597 respondents, 28.9% reported depressive symptoms. Psychological functions were assessed using the Arabic version of the Depression, Anxiety, and Stress Scale (DASS-21). During the COVID-19 pandemic, many people subconsciously may have had some symptoms of depression based on the news, the gravity of presentation, and the long duration of the pandemic. Because of multiple dependent lifestyle factors in our study, we could not assess the anxiety and stress levels in the population.

**Study limitations**

As our study is interview-based, there exists the possibility of reporting bias from the participants. The sample size was relatively small.

**Conclusions**

Based on the study results, some lifestyle changes such as weight gain, decreased physical activity, increased online shopping, increased financial difficulty, decreased social distancing, decreased mask use, and increased telemedicine use were reported during the COVID-19 pandemic. The government of Saudi Arabia has made many efforts during the COVID-19 pandemic to promote health measures and appropriate health care to the public. As our study was a cross-sectional study, further studies to substantiate the findings are needed.

**Ethical approval**

An institutional ethical committee certificate for publication was obtained from the Regional Ethics Committee with approval number 1442-1542510 dated 28/03/21.

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**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for the data collectors and authors assured confidentiality of the individual information. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Key Message**

Among the PHC attendees, weight gain increased and approximately one-third of them slept for <6 hours. Close to one-fourth of people have depression, and online shopping increased. Almost three-fourth of people were followed masking and social distancing at all times.

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**Conflicts of interest**

There are no conflicts of interest.
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