Population healthy lifestyle changes in Abha city during COVID-19 lockdown, Saudi Arabia

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ABSTRACT

Background: The pandemic emergence was in Asia late last year, the virus has spread to every continent except Antarctica. Cases are rising daily in Africa the Americas, and Europe. (2, 3) coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Many preventive measures were recommended by WHO to minimize virus transmission including hand washing and social distancing, travel restrictions, and the closing of gathering areas including universities and schools up to partial or complete lockdown. These measures affected public lifestyle which obligated many persons and families to modify their living condition, sleep hygiene and their routine daily activities to cope with new procedures which is a challenge. Aim: To assess population healthy lifestyle changes during lockdown in Abha city, KSA during COVID-19 pandemic. Methodology: A descriptive cross-sectional approach was used targeting all accessible population in Abha city. Data were collected from participants using electronic pre-structured questionnaire. The tool will cover participants’ socio-demographic data, participants’ medical history, perception regarding lockdown and home quarantine, and different lifestyle aspects during lockdown. Results: A total sample of 1641 respondents were included in the current survey. Male participants were 733 (44.7%) and (61.1% of the participants aged 35 years or more. Exact of 85% of the participants agreed on lockdown efficacy. Daily sleep hours for less than 8 hours were recorded for 662 (40.3%) participants. As for dietary habits, exact of 885 participants (53.9%) changed their dietary habits during lockdown. sport practice during lockdown was reported by 981 (59.8%) of the participants. Lockdown related behaviour data showed that 98.5% of the participants were committed to lockdown either partially (18.8%) or completely (79.6%). Conclusions and Recommendations: In conclusion, the current study revealed that COVID-19 pandemic through lockdown as one of the recommended precautions to minimize virus transmission modified nearly all aspects of daily lifestyle including dietary habits, behaviour, social relations, and life sharing.

Keywords: COVID-19, dietary habits, general population, lifestyle, lockdown, practice

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2020 and recognized it as a pandemic on 11 March 2020.\textsuperscript{3,4} As of 8 April 2020, nearly 1.44 million cases of COVID-19 have been diagnosed in 209 countries and territories, causing nearly 83,400 deaths. About 308,000 people have recovered.\textsuperscript{5,6} The majority of cases were old aged but some children cases and few deaths among children were recorded.

Several preventive measures were recommended by WHO to minimize virus transmission including hand washing and social distancing (updated now to physical distancing) to avoid close contact between individuals. Physical distancing was managed by different rules of which home quarantines, travel restrictions, and the closing of gathering areas including universities and schools up to partial or complete lockdown.\textsuperscript{7,8} These sudden actions affected public lifestyle which obligated many persons and families to modify their living condition, sleep hygiene and their everyday activities to cope with new procedures which is a great challenge. Population became more aware regarding personal hygiene, health care, and healthy lifestyle including healthy food and behaviour.\textsuperscript{9}

Saudi community is hyperactive with high interest in travelling, social gathering, and familiar relations especially on holidays and social events. After lockdown due to COVID19, there was limited moving out of home and prohibited travelling. This in turn will affect public mental and psychological health and to cope with, many modifications in Saudi family’s lifestyle are expected.

The lifestyle medicine concept recently evolve, in fact it is not a remarkable change from what has been well-known since ancient periods. Recently, national organizations such as the American Heart Association and the American Diabetes Association, applying compromise panels to initiate practice guidelines, have reliably recommended that disease control should begin with “diet and exercise” changes, before medications are considered. This is the main role for primary care physicians.\textsuperscript{10,11}

Lifestyle behaviours during the COVID-19 was studied by Balanzá-Martínez,\textsuperscript{12} who reported that many psychological changes, feeling loneliness, feeling of isolation but increased home exercises. Di Renzo L, \textit{et al.} conducted a study to assess the impact of the COVID-19 pandemic on eating habits and lifestyle changes among the Italian population,\textsuperscript{13} the study revealed that the of weight gain was observed in 48.6% of the population; stopping smoking was reported among 3.3% of smokers; with minor improvement in physical activity.

The current survey aimed to assess population healthy lifestyle changes during lockdown in Abha city, KSA during COVID-19 pandemic. This included general lifestyle features, eating behaviour, physical activity, and commitment to lockdown.

\textbf{Methodology}

A descriptive cross-sectional approach was used targeting all accessible population in Abha city, the capital of Aseer province, Southern of Saudi Arabia. Saudis with ages of 18 years or more living in Abha since before lockdown were invited to participate in the survey. A total sample of 800 respondents was required based on the assumed healthy changes will be recorded among at least 50% of the individuals (due to lack of relevant information) with precision of 5% at 95% confidence level and using design effect equals 2. After obtaining permission from Institutional ethics committee, data collection started. Data were collected from participants using electronic pre-structured questionnaire. The questionnaire was uploaded online using social media platforms by the researchers and their relatives during the period from 15\textsuperscript{th} March till 30\textsuperscript{th} of April 2020. All accessible and eligible population in the study setting were invited to fill the attached tool. The researchers constructed the survey tool after intensive literature review and expert’s consultation. Tool was reviewed using a panel of 5 experts for content validity. Tool reliability was assessed using pilot study of 30 participants with reliability coefficient ($\alpha$-Cronbach’s) of 0.76. The tool will cover the following data: Participants’ socio-demographic data like age, gender, residence, education, participants’ medical history, participants perception regarding lockdown and home quarantine, and participants general awareness and attitude towards COVID-19 pandemic. Also, eating behavior during lockdown, physical activity during lockdown, communication methods with others during lockdown, daily life activity during lockdown, smoking habit during home quarantine, and commitment to home quarantine were assessed in the questionnaire.

\textbf{Data analysis}

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. $P$ value less than 0.05 was statistically significant. Descriptive analysis based on frequency and percent distribution was done for all variables including participants personal data, general lifestyle during lockdown, dietary habits during lockdown, and physical activities besides source of information. Crosstabulation was used to assess distribution of participants different lifestyles by their gender. significance of relations in cross tabulation was tested using Pearson Chi-square test.

\textbf{Results}

A total sample of 1641 respondents were included in the current survey. Male participants were 733 (44.7%) and (61.1% of the participants aged 35 years or more. Regarding qualification, 1032 (62.9%) of participants had bachelor’s degree and 274 (16.7%) had post graduate degree. Governmental job was recorded among 1322 participants (80.6%) while 1254 (76.4%) of the participants were married. Family size exceeded 5 persons among 804 (49%) participants and monthly income over 15000 SR was recorded for 29.3% of the respondents. Cigarette smoking was recorded among 193 (11.8%) of the participants and 64.2% smoked less than 15 cigarettes per day. Exact of 315 (19.2%) of the participants had chronic health problem, 24.1% of them...
Table 1: Bio-demographic data of survey participants regarding lifestyle, Abha, Saudi Arabia

| Bio-demographic data       | No  | %    |
|----------------------------|-----|------|
| Gender                     |     |      |
| Male                       | 733 | 44.7%|
| Female                     | 908 | 55.3%|
| Age                        |     |      |
| 15-25                      | 186 | 11.3%|
| 26-35                      | 453 | 27.6%|
| 36-45                      | 538 | 32.8%|
| 45+                        | 464 | 28.3%|
| Qualification              |     |      |
| Primary                    | 13  | 0.8% |
| Intermediate               | 26  | 1.6% |
| Secondary/diplome          | 296 | 18.0%|
| Bachelor                   | 1032| 62.9%|
| Postgraduate               | 274 | 16.7%|
| Job                        |     |      |
| Governmental               | 1322| 80.6%|
| Private                    | 319 | 19.4%|
| Marital status             |     |      |
| Single                     | 318 | 19.4%|
| Married                    | 1254| 76.4%|
| Divorced/widow             | 69  | 4.2% |
| Family size                |     |      |
| <2                         | 107 | 6.5% |
| 2-5                        | 730 | 44.5%|
| >5                         | 804 | 49.0%|
| Monthly income             |     |      |
| <5000 SR                   | 340 | 20.7%|
| 5000-15000 SR              | 820 | 50.0%|
| >15000 SR                  | 481 | 29.3%|
| Smoking                    |     |      |
| Yes                        | 193 | 11.8%|
| No                         | 1448| 88.2%|
| Number of daily cigarettes |     |      |
| <15 cigarettes/day         | 124 | 64.2%|
| 15-20/day                  | 53  | 27.5%|
| >20 cigarettes/day         | 16  | 8.3% |
| Chronic health problem     |     |      |
| Yes                        | 315 | 19.2%|
| No                         | 1326| 80.8%|
| Mention                    |     |      |
| Bronchial asthma           | 40  | 12.7%|
| DM                         | 76  | 24.1%|
| HTN                        | 64  | 20.3%|
| Hypothyroidism             | 36  | 11.4%|
| Immunocompromised          | 11  | 3.5% |
| Non relevant               | 65  | 20.6%|
| DM&HTN                     | 23  | 7.3% |

As for dietary habits [Table 3], exact of 885 participants (53.9%) changed their dietary habits during lockdown. Sharing in food preparation was reported by 92.3% of the participants especially among females. Calling delivery 2-5 times weekly was reported by 2.9% of the participants and only 5 reported they call for delivery daily. Using delivery applications 2-5 times weekly was reported by 44 participants (2.7%). Having vegetables during lockdown was recorded among 97.5% of the respondents and 37.8% of them reported that they have sweets 2-5 times per week and having salt besides food for 2-5 times weekly was reported among 45.3% of the participants. Fatty food intake for 2-5 times weekly was reported by 36.6% of the respondents and 26.8% of the participants reported that they have 8-10 cups of water daily. Stimulants (tea and coffee) intake of more than 4 cups daily was reported by 14% of the participants and 5.7% reported that they have power drinks. Exact of 637 participants (38.8%) reported that they gained weight during lockdown and only 14.8% lost weight.

Table 4 demonstrates that sport practice during lockdown was reported by 981 (59.8%) of the participants. Practicing sports for 15-30 minutes daily was recorded among 48.9% of the participants and 51% practice sports for less than 3 times weekly while 33.1% practice sports for more than 3 times weekly.

Lockdown related behaviour data showed that 98.5% of the participants were committed to lockdown either partially (18.8%) or completely (79.6%). As for precautions during lockdown, frequent hand washing was reported by 1444 (88%) of the participants followed by physical distancing (73.8%), keep distance with others outdoors (61.9%), and wearing mask outdoors (51%) [Table 5].

Figure 1 shows the source of information regarding COVID-19 as reported by survey respondents. The most reported source was social media (83.3%) followed by mass media (52.5%), health care professionals (23.3%), and books (7.4%).

**Discussion**

The current study aimed to study the lifestyle of general population in Abha city during lockdown due to COVID-19 pandemic. The study included all eligible respondents for the survey questionnaire which covered different aspects of lifestyle including general lifestyle and daily activities besides dietary habits and sport practice. The survey respondents were variable regarding ages, gender, educational level, and even social level. At first, more than 80% of the respondents agreed on the significance of the lockdown but it was significantly higher among females than males. This can be logic as homestay is usually against male nature. This can explain other finding that only 80% of the survey participants were completely adherent to home stay during lockdown which was higher among females than males. As for sleeping, near half of the respondents reported sleeping for less than 8 hours daily besides that the near half of the respondents reported having 3 cups of coffee or more daily,
This poor sleep hygiene was significantly higher among males than females. Many explanations may be provided including that due to lockdown, no morning work, no physical activity, and no duties which makes persons feel relaxed all the time with no effort and less need for sleeping. This also can be strengthened by that nearly 40% of the participants had more than 3 hours spare time daily and half of them said that they relax during this spare time. Other drawbacks for stay home during lockdown reported by the participants was nearly half of the sample reported having family troubles which was more noted among females. Regarding dietary habits, more than half of the participants reported that they changed their dietary habits. The surprising findings were that most of the participants recorded low frequency of calling delivery or using delivery applications during lockdown which means less intake of fast food and more chance to have homemade food. This also was confirmed by that more than 90% of the participants reported sharing in food preparation during lockdown especially male participants. Also, having more healthy food was reported by the survey respondents and more fluid intake daily. This can be response to health education and clinical advices that having healthy food and high fluid intake may play a role in minimizing infection with the virus. The drawback that was recorded in dietary habits was that about one third of the participants gained weight during lockdown which may be a result of long duration of home stay and lack of physical activities. Nearly half of the participants reported that they practice sports during lockdown for 15-30 minutes but less than three times weekly. Although this rate per week is not ideal but it is good sign for public awareness regarding the importance of practicing sports during long stay duration. The most good signs and messages that were extracted from the respondents was that general population were updated regarding COVID-19 pandemic and its precaution as frequent handwashing was reported by more than 80% of the participants besides physical distancing and wearing masks especially if they were outdoors. Other good messages included strengthening familiar relation as 81% of the participants spent their time during homestay with their families besides commination with all available tools including phone calls, social media, or even virtual meeting software. Most of the reopened reported that they were enjoyed performing daily physical activities with their mood good. This pandemic as much it harmed many aspects especially the economy but repaired many other social and behavioural defects in the human being. Besides, it gave the environment a chance to breath and relax. Similar studies revealed that adopting unhealthy nutrition and
behaviours may have adverse outcomes on mental and physical health.\[16\] Diminished physical activity resulting from home

Table 3: Distribution of dietary habits among survey partisans during lockdown by their gender in Abha, Saudi Arabia

| Dietary habits during lockdown | Total | Male | Female | P |
|-------------------------------|-------|------|--------|---|
| Changed dietary habits during lockdown | 885 | 356 | 529 | 0.001* |
| No                             | 756 | 377 | 379 | 46.1% |
| Share in food preparation during lockdown | 127 | 114 | 13 | 7.7% |
| No                             | 634 | 488 | 146 | 38.6% |
| Most times                     | 880 | 131 | 749 | 53.6% |
| Frequency of calling delivery during lockdown | 1115 | 471 | 644 | 67.9% |
| Never                          | 473 | 229 | 46.3% |
| <2 times/week                  | 48 | 28 | 3.8% |
| 2-5 times/week                 | 5 | 5 | 0.7% |
| >5 times/week                  | 920 | 435 | 485 | 56.1% |
| Frequency of using delivery applications during lockdown | 677 | 281 | 396 | 41.3% |
| Never                          | 758 | 339 | 419 | 46.2% |
| <2 times/week                  | 44 | 17 | 27 | 2.7% |
| 2-5 times/week                 | 842 | 368 | 474 | 51.3% |
| Frequency of having vegetables during lockdown | 88 | 26 | 15 | 2.5% |
| Never                          | 781 | 368 | 474 | 47.6% |
| <2 times/week                  | 744 | 304 | 440 | 45.3% |
| 2-5 times/week                 | 913 | 391 | 522 | 55.6% |
| Frequency of having fruits during lockdown | 108 | 67 | 41 | 6.6% |
| Never                          | 620 | 275 | 345 | 37.8% |
| <2 times/week                  | 781 | 368 | 474 | 47.6% |
| 2-5 times/week                 | 1114 | 462 | 652 | 67.9% |
| Frequency of having salt during lockdown | 116 | 61 | 55 | 7.1% |
| Never                          | 781 | 368 | 474 | 47.6% |
| <2 times/week                  | 744 | 304 | 440 | 45.3% |
| 2-5 times/week                 | 929 | 402 | 527 | 56.6% |
| Frequency of having water during lockdown | 1114 | 462 | 652 | 67.9% |
| <8 cups daily                  | 810 | 217 | 223 | 26.8% |
| 8-10 cups daily                | 1114 | 462 | 652 | 67.9% |
| >10 cups daily                 | 87 | 54 | 33 | 5.3% |
| Frequency of having stimulants during lockdown | 295 | 128 | 167 | 18.0% |
| No                             | 651 | 242 | 409 | 39.7% |
| 1-2 cups daily                 | 466 | 229 | 237 | 28.4% |
| 3-4 cups daily                 | 229 | 134 | 95 | 14.0% |
| >4 cups daily                  | 94 | 53 | 41 | 5.7% |
| Have power drinks during lockdown | 1547 | 680 | 867 | 94.3% |
| No                             | 637 | 270 | 367 | 38.8% |
| Gained weight                  | 243 | 112 | 131 | 14.8% |
| Lost weight                    | 761 | 351 | 410 | 46.4% |
| Weight change during lockdown  | 981 | 432 | 549 | 59.8% |
| Yes                            | 660 | 301 | 359 | 40.2% |
| No                             | 243 | 117 | 126 | 24.8% |
| Duration of practicing sports   | 480 | 190 | 290 | 48.9% |
| <15 min/day                    | 258 | 125 | 133 | 30.0% |
| 15-30 min/day                  | 623 | 275 | 348 | 51.0% |
| >30 min/day                    | 194 | 95 | 99 | 15.9% |
| Frequency of practicing sports  | 405 | 187 | 218 | 33.1% |
| <3 times/week                  | 3 times/week | 3 times/week | 3 times/week |

P: Pearson X² test. *P<0.05 (significant)

Table 4: Distribution of daily activities and sports among survey partisans during lockdown by their gender in Abha, Saudi Arabia

| Daily activities and sports | Total | Male | Female | P |
|-----------------------------|-------|------|--------|---|
| Practice sports during lockdown | Yes | 981 | 432 | 59.8% |
| No                          | 660 | 301 | 359 | 40.2% |
| Duration of practicing sports | <15 min/day | 243 | 117 | 24.8% |
| 15-30 min/day               | 480 | 190 | 290 | 48.9% |
| >30 min/day                 | 258 | 125 | 133 | 30.0% |
| Frequency of practicing sports | <3 times/week | 623 | 275 | 51.0% |
| 3 times/week                | 194 | 95 | 99 | 15.9% |
| >3 times/week               | 405 | 187 | 218 | 33.1% |

P: Pearson X² test. *P<0.05 (significant)

sedentary lifestyle, with reduced outdoor time and increased screen time are reported during COVID-19 pandemic. These
isolation may increase negative cardio-metabolic and mental effects.\(^1\) Other study assessed effect of physical distancing and lockdown polices during COVID-19 on lifestyle changes with its drawbacks on mental and psychological health.\(^2\) Also, during SARS epidemic, psychological and lifestyle changes were reported due to exercise, more time for relaxation and restorative sleep.\(^3\) The COVID-19 pandemic signifies a huge impact on public health, causing sudden dramatic lifestyle changes, due to social distancing and home isolation. Tus changes had bad economic and social consequences. Enhancing public health during this pandemic necessitates not only awareness from the medical and biological sciences, but also of all human sciences related to lifestyle, social and behavioural studies, including dietary habits and lifestyle.

### Conclusions and Recommendations

In conclusion, the current study revealed that COVID-19 pandemic through lockdown as one of the recommended precautions to minimize virus transmission modified nearly all aspects of daily lifestyle including dietary habits, behaviour, social relations, and life sharing. Many positive messages were extracted and discovered during lockdown besides some other drawbacks related to lack of activity and having spare time. Home stay during lockdown is a golden chance to repair all past breakthrough due to engaging in daily life affairs inside and outside family.

### Ethical approval

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics and Research Committee of the King Khalid University.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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**Table 5: Distribution of lockdown related behaviour among survey partisans during lockdown by their gender in Abha, Saudi Arabia**

| Lockdown related behaviour                        | Total | Gender |
|---------------------------------------------------|-------|--------|
|                                                    | No    | %      | Male | %    | Female | %    |
| Commitment with lockdown                          |       |        |      |       |        |
| Not at all                                        | 25    | 1.5%   | 16   | 2.2% | 9      | 1.0% |
| Partially                                         | 309   | 18.8%  | 152  | 20.7%| 157    | 17.3%|
| Completely                                        | 1307  | 79.6%  | 565  | 77.1%| 742    | 81.7%|
| Precautions you applied during lockdown           |       |        |      |       |        |
| Frequent hand washing                             | 1444  | 88.0%  | 661  | 90.2%| 783    | 86.2%|
| Wearing mask outdoor                              | 837   | 51.0%  | 433  | 59.1%| 404    | 44.5%|
| Keep distance with others outdoors                | 1015  | 61.9%  | 503  | 68.6%| 512    | 56.4%|
| Physical distancing                               | 1211  | 73.8%  | 546  | 74.5%| 665    | 73.2%|
| Seek for medical care if had symptoms             | 194   | 11.8%  | 104  | 14.2%| 90     | 9.9% |
| Precautions you applied during lockdown           |       |        |      |       |        |
| Frequent hand washing                             | 1444  | 88.0%  | 661  | 90.2%| 783    | 86.2%|
| Wearing mask outdoor                              | 837   | 51.0%  | 433  | 59.1%| 404    | 44.5%|
| Keep distance with others outdoors                | 1015  | 61.9%  | 503  | 68.6%| 512    | 56.4%|
| Physical distancing                               | 1211  | 73.8%  | 546  | 74.5%| 665    | 73.2%|
| Seek for medical care if had symptoms             | 194   | 11.8%  | 104  | 14.2%| 90     | 9.9% |
| Used applications during lockdown                 |       |        |      |       |        |
| Not used                                          | 1020  | 62.2%  | 409  | 55.8%| 611    | 67.3%|
| No. 937                                           | 338   | 20.6%  | 177  | 24.1%| 161    | 17.7%|
| Health application                                | 219   | 13.3%  | 119  | 16.2%| 100    | 11.0%|
| Appointment application                           | 314   | 19.1%  | 185  | 25.2%| 129    | 14.2%|
| Ensured application                               | 65    | 4.0%   | 42   | 5.7% | 23     | 2.5% |

\(^{P}\) Pearson \( \chi \) test. \(^{*}\)\(P<0.05\) (significant)

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**Figure 1**: Source of information regarding COVID-19 among general population in Abha, Saudi Arabia
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