European Review for Medical and Pharmacological Sciences 2022; 26: 4092-4101

A nationwide survey to assess COVID-19's impact on health and lifestyle in Saudi Arabia

T.M. BIN MAHFOZ[1], R.A. SHAIK[2], M.S. AHMAD[2], N.A.N. ALZERWI[3], R. ALMUTAIRI[4]

[1]Otolaryngology Department College of Medicine, Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia
[2]Department of Community Medicine and Public Health, College of Medicine, Majmaah University, Al Majmaah, Saudi Arabia
[3]Department of Surgery, College of Medicine, Majmaah University, Al Majmaah, Saudi Arabia
[4]King Khalid Hospital, Al Majmaah, Saudi Arabia

Abstract. – OBJECTIVE: Since COVID-19 outbreak, there is a lack of extensive literature on the impact of the COVID-19 pandemic on health and lifestyle. The aim of the study was (1) to assess the COVID-19 related knowledge and its socio-demographic correlates in individuals from different parts of Saudi Arabia, (2) to evaluate the health-related impact and lifestyle changes in the Saudi population because of the COVID-19 pandemic, and (3) to determine the perceived importance of future preparedness among residents.

MATERIALS AND METHODS: A cross-sectional study was conducted in different regions of Saudi Arabia from December 2020 to February 2022. Individuals aged 18 years and above were surveyed from different parts of the county. The questionnaires were made available online, and the participants filled them in. The questionnaires included COVID-19 related knowledge, the assessment of the health impact of COVID-19, perceived importance of future preparation for the pandemic, lifestyles, and demographics. Likert plot, univariate and multivariate logistic regression analyses were done.

RESULTS: A total of 616 respondents were included in the study. The majority of the repondents were female (58.6%). 36% of the respondents considered their knowledge level on the novel coronavirus as very good. 43.5% said their knowledge level on preventing the spread of the novel coronavirus is excellent. Retired people were 84% (aOR 0.16, 95% CI 0.03-0.78) less likely of higher physical activity as compared to working (≥40 hrs/week) professionals. Separated/divorced/widowed and singles were 3.65 times (aOR 3.65, 95% CI 1.34-9.94) and 2.23 times (aOR 2.23, 95% CI 1.28-3.89) more likely of higher screen time as compared to those who were married/cohabitation/common-law.

CONCLUSIONS: Lifestyle in Saudi Arabia has changed significantly due to the COVID-19 pandemic. Healthy habits such as eating at home and cooking at home have increased, while unhealthy habits such as reduced physical activity, screen time have increased.

Key Words:
COVID-19, Lifestyle, Sedentary behavior, Screen time, Knowledge.

Introduction

The novel coronavirus (COVID-19) outbreak, since December 2019 in Wuhan, had been historically one of the most highly contagious and rapidly spreading viruses. On April 18, 2021, there were 4,04,970 confirmed cases of COVID-19, with a mortality rate of 2%. The United States (US) suffered from the highest number of cases, followed by India, Brazil, France, and Russia[1]. It all happened in one year and had already made unprecedented disruptions in the healthcare systems and the economy[2].

Many countries, including Saudi Arabia, had travel restrictions in the affected cities at the policy level. Those having severe outbreaks even had ceasing or limited transportation, banning or restricting opening hours of restaurants or businesses at high risk of infection, social distancing, or mass quarantine. Residents of Saudi Arabia were mindful of preventive measures at the individual level, including using protective facial masks, hand hygiene, cough etiquette, and avoiding unnecessary social activities[3].

Facing such abrupt changes along with the threat of the COVID-19 infection would likely have a profound impact on various health-related problems in individuals around the world. Hence, the COVID-19 pandemic can impose severe deterioration of an individual's health and lifestyle.

Some studies[4,5] have investigated the psychological and social impacts of individuals and groups under COVID-19. For example, Zhang et al[4] investigated the social impact, mental health impact, and quality of life in a China province. In addition, a

Corresponding Author: Turki M. Bin Mahfoz, MD; e-mail: TMmahfoz@imamu.edu.sa

cross-sectional web-based study carried out in India showed a substantial reduction in physical activity along with an increase in daily screen time in men and upper socioeconomic class[5].

COVID-19 pandemic and the steps taken to control it have had a noticeable effect on the population's lifestyle choices[6]. Experts agree that lifestyle-related predictors of weight gain and cardiometabolic risk were increased and that they should be screened for and treated during COVID-19 to avoid obesity and improve overall health[7].

A reduction in engagement in physical activity at all levels coupled with an increase in daily sitting and screen time due to confinement as found across the literature. Al-Husseini et al[8] conducted a survey in Riyadh, Saudi Arabia, noted the significant change of dietary habits with quality and quantity of food compromised. Since COVID-19's Impact is ongoing, a lack of extensive literature suggests psychological and social impacts of lockdown or quarantine nationally. To our knowledge to date, no nationwide studies are assessing the impact of individuals on their health-related issues and lifestyle in Saudi Arabia. In addition, there can be a varying degree of pandemic and preventive measures adopted across cities or communities; how these may influence the health impact of COVID-19 remains to be examined. Hence, this study was planned to assess the COVID-19 related knowledge and its socio-demographic correlates in individuals from different parts of Saudi Arabia to determine the health-related impact and lifestyle changes in the Saudi population because of the COVID-19 pandemic to determine the perceived importance of future preparedness among residents.

Materials and Methods

A cross-sectional study was conducted in different regions of Saudi Arabia from December 2020 to February 2022. This is a national survey, with questionnaires available in Arabia. The questionnaires were made available online. Six hundred and sixteen individuals aged 18 years and above from different parts of the country were recruited for the study. The questionnaire contained sections on Socio-demographics, Doctor-diagnosed medical history, perception about personal COVID knowledge, COVID status. The outcome measures were assessed through the following method.

Health Impact of COVID-19

Subjects were asked to rate their health-related issues during the COVID-19 compared with their everyday life before the pandemic on a 5-point Likert scale. The health-related issues cover physical and psychological well-being, dietary, exercise, sedentary behaviors, and finance. Perceived importance for better preparation of a pandemic: online doctor consultation, 24 hours personalized health advice by a chatbot, online shopping, food delivery, and community pharmacy. Lifestyles (during COVID-19): hours of screen time in a week (TV/Video games playing/ Laptop computer/Smartphone/Tablet) and the intensity of exercise. The validity of the questionnaire was assessed through expert reviews, translation and back translation of language methods. In addition, pilot testing of the questionnaire on 10% of the current sample was studied before starting this study to ensure the reliability and validity of the questionnaire.

Sample Size

The sample size calculation was based on estimating the prevalence of a health issue. Taking the most conservative scenario of 50%, with a 5% margin of error in a 95% confidence interval, we needed 385 subjects. To allow incomplete questionnaires, we targeted 500 subjects from different parts of the country.

Statistical Analysis

RStudio was used for data analysis [Reference: RStudio Team (2020); RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL http://www.rstudio.com/)]. Descriptive analysis was carried out by frequency and proportion for background characteristics and medical history. Similarly, for knowledge and perception on COVID-19 and lifestyle changes during the COVID-19 pandemic, descriptive analysis was performed by frequency and proportion. The Likert plot was used to describe health and other changes during the COVID-19 pandemic and perceived importance for better preparing a pandemic. Both univariate and multivariable logistic regression analysis was performed to determine the predictors for higher physical activity and higher screen time during the COVID-19 pandemic. Exercise greater than 3 days a week was considered higher physical activity, whereas screen time per day greater than 7 hours per day was considered higher screen time. The odds ratio along with 95% CI is presented. p-value < 0.05 was considered statistically significant.

Results

A total of 616 respondents were included in the study. Majority of them were female (58.6%), in the

Table I. Background characteristics and medical history of the study population.

Socio-demographic characteristics and Medical history		Frequency	Percentage
Age group	18 to 24	215	34.9%
	25 to 34	198	32.1%
	35 to 49	159	25.8%
	≥50	44	7.1%
	Working (≥40 hrs/wk)	120	19.5%
	Working (1-39 hrs/wk)	121	19.6%
BMI	Underweight	38	6.2%
	Normal	254	41.2%
	Overweight	200	32.5%
	Obese	124	20.1%
Medical history	Hypertension	25	4.1%
	High cholesterol	42	6.8%
	Pre Diabetes Mellitus	13	2.1%
	Diabetes Mellitus	25	4.1%
	Fatty liver disease	5	.8%
	Heart attack	3	.5%
	Stroke	1	.2%
	COPD diseases	12	1.9%
	Cancer	3	.5%
	Gastric ulcer	14	2.3%
	Irritable Bowel Syndrome	42	6.8%
	Insomnia	12	1.9%
	Depression	28	4.5%
	Anxiety	41	6.7%
	Eczema	21	3.4%
	Nephropathy	6	1.0%
	Autoimmune disease	6	1.0%
	Parkinson's disease	2	.3%
	Epilepsy	2	.3%
	Hearing problems	8	1.3%
	Any other chronic disease	45	7.3%
	No chronic disease	398	64.6%

age group 18 to 24 (34.9%), single (51.5%), highest qualification bachelor (62.3%), student (33.6%), normal BMI (41.2%). 25.2% of the respondents were practicing health professionals. 64.6% of the respondents had no chronic disease. The details of medical history can be seen in Table I.

Among 616 respondents, 39 (6.3%) were infected with the coronavirus, while 19 (3.1%) showed signs and symptoms of the disease but were not yet confirmed. In addition, 71.8% of the respondents knew people infected with coronavirus in their immediate social environment, while 4.5% knew people who showed signs and symptoms of the disease but were not yet confirmed.

36% of the respondents considered their knowledge level on the novel coronavirus as very good. 43.5% said their knowledge level on preventing the spread of the novel coronavirus is excellent. Only 18.8% of the respondents thought they had absolutely adequate knowledge about the novel coronavirus. 13.5% of the respondents considered they were very susceptible to an infection with the novel coronavirus. Only 2.9% of the respondents thought contracting the novel coronavirus would be very severe for them. 7.3% of the respondents were of the perception that spread of the novel coronavirus in their community was very severe (Figure 1).

Having a meal at home, cook at home, duration of sitting, and duration of screen time were on the higher side during the COVID-19 pandemic compared to everyday life for most of the respondents. In addition, 35.9% of the respondents smoked substantially less during the COVID-19 pandemic than in their daily life. The amount of exercise increased for 24.8% of the respondents, whereas it decreased by 30.1% (Figure 2).

Weight increased for 36.7% of the respondents, while appetite increased for 31.5% of the respondents during the COVID-19 pandemic compared to everyday life. Physical health, sleep quality, and

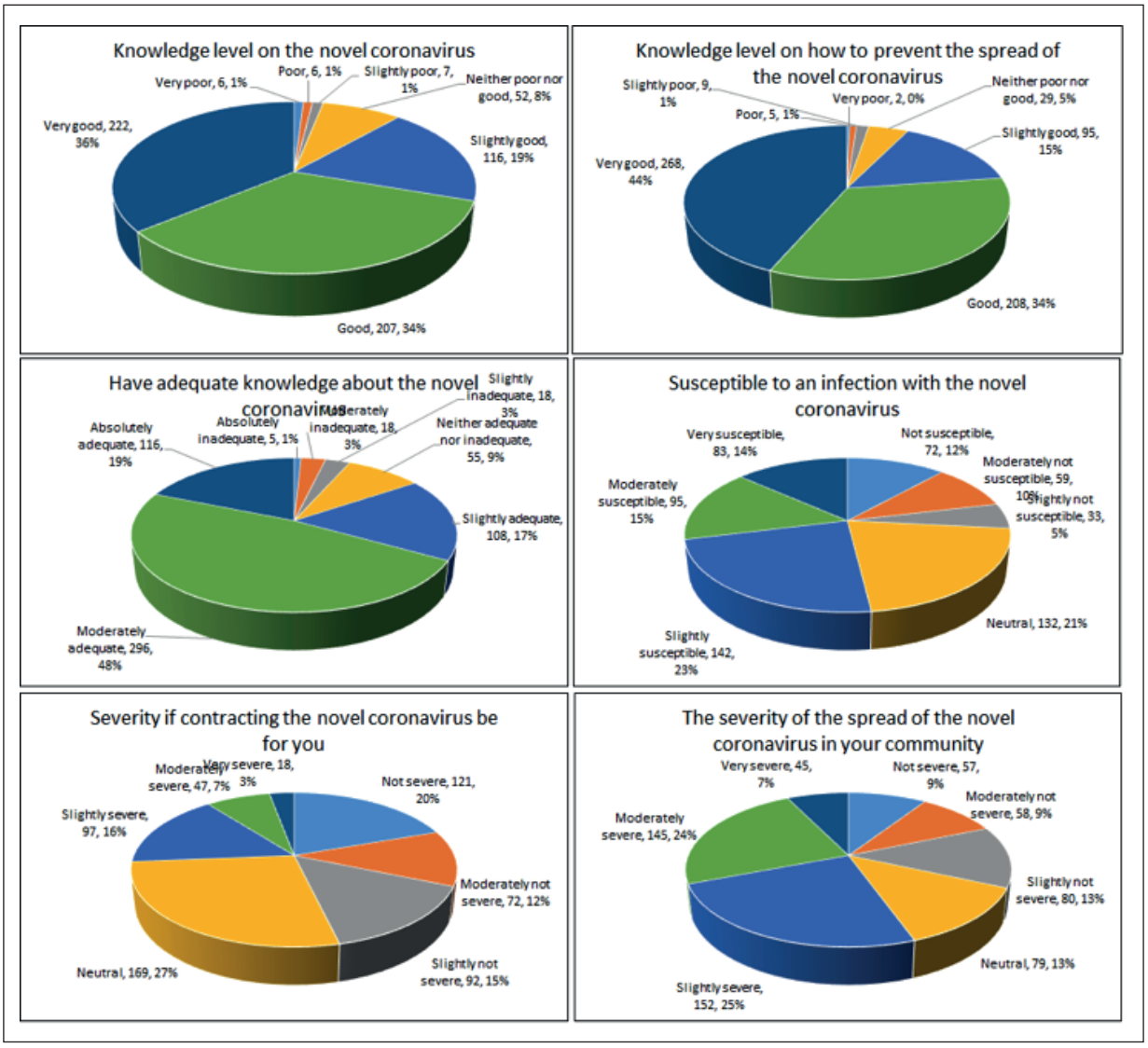


Figure 1. Knowledge and Perception on COVID-19 in the study population.

quality of life improved for 21.9%, 28.5%, and 26.2% of the respondents, respectively, whereas physical health, sleep quality, and quality of life decreased for 20.4%, 28.5%, and 33.3% of the respondents respectively. Mental burden and emotional distress increased by 40.1% and 31.4% of the respondents, respectively. The economic burden increased for 26.3% of the respondents (Figure 3).

33.1% of the respondents perceived medicine delivery as extremely important for the future preparation of a pandemic. Similarly, 33.1% of the respondents perceived online shopping as extremely important. 29.4% of the respondents perceived food delivery as extremely important. 27.1% of the respondents perceived getting medicine prescribed in a hospital visit/follow-up in a community pharmacy as extremely important (Figure 4).

Table II shows the results from binary logistic regression analysis for higher physical activity during the COVID-19 pandemic. Some of the variables were re-categorized in the logistic regression due to low frequency in specific categories. Both univariate and multivariable binary logistic regression was used to examine the factors associated with higher physical activity. Both univariate and multivariable models showed that occupation and BMI were significant predictors of higher physical activity during COVID-19 pandemic.

From the multivariable model, retired people were 84% (aOR 0.16, 95% CI 0.03-0.78) less

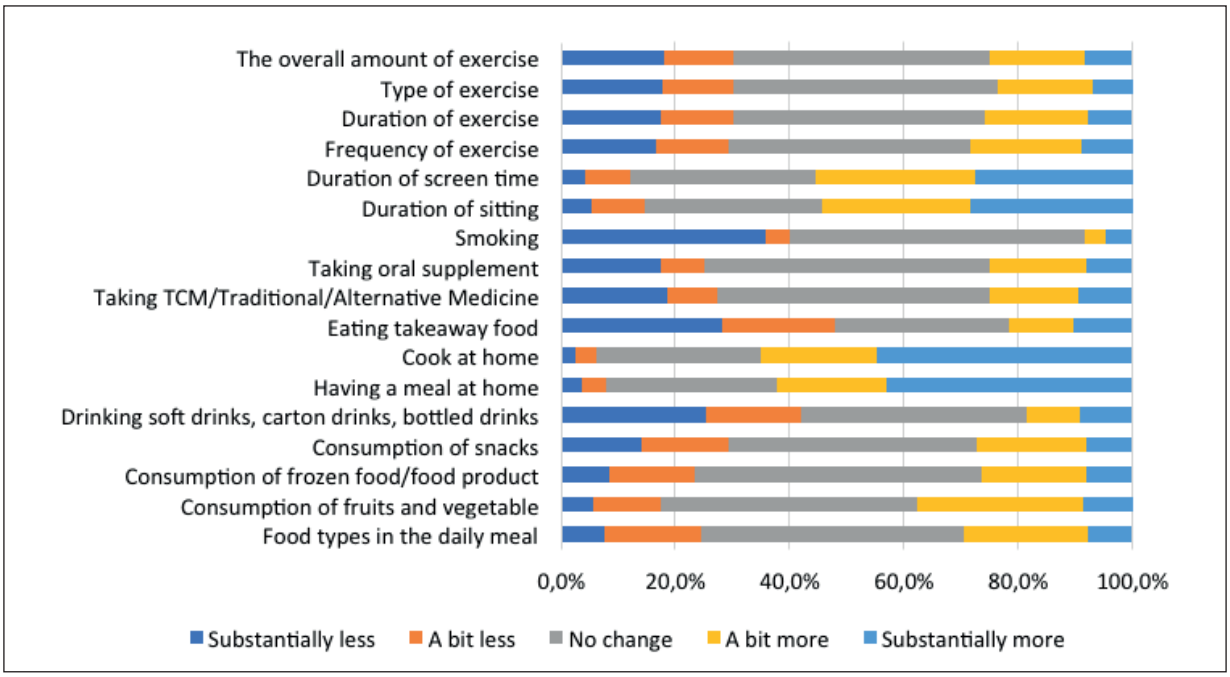


Figure 2. Degree of lifestyle changes during the COVID-19 pandemic, when compared with normal life.

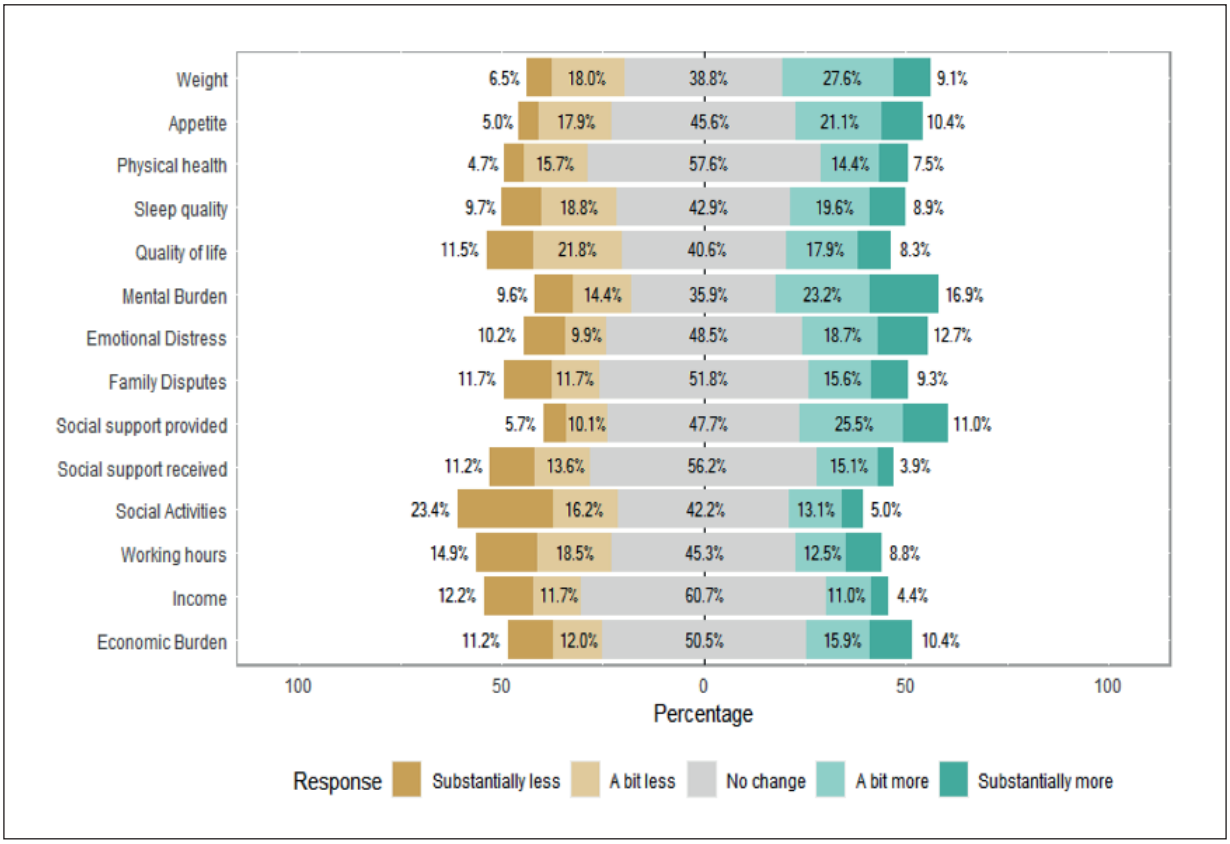
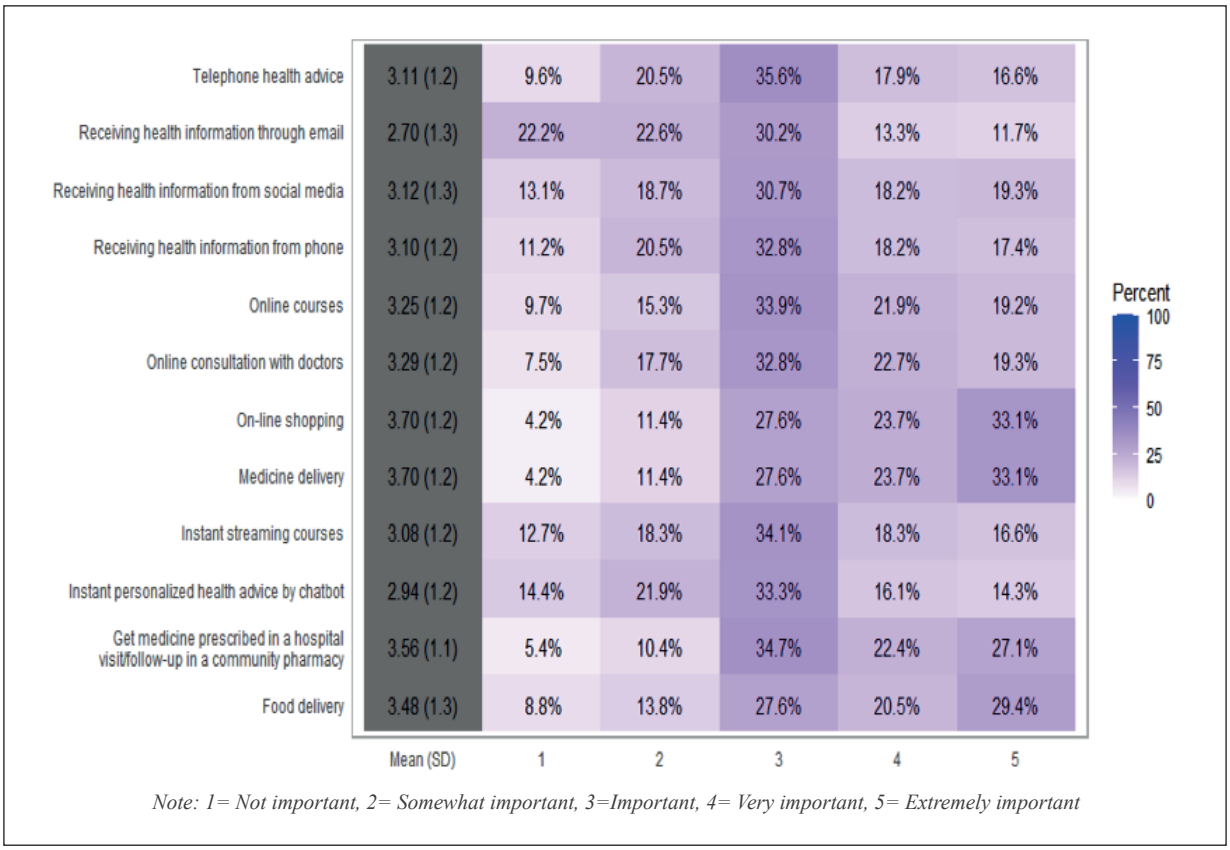


Figure 3. Degree of health and other changes during the COVID-19 pandemic, when compared with everyday life.



Note: 1= Not important, 2= Somewhat important, 3=Important, 4= Very important, 5= Extremely important

Figure 4. Perceived importance for better preparation of a pandemic.

likely of higher physical activity as compared to working (≥40 hrs/week) professionals. Conversely, overweight people were 4.4 times (aOR 4.40, 95% CI 1.25-15.52) more likely of higher physical activity than underweight people.

Table III shows the results from binary logistic regression analysis for higher screen time during the COVID-19 pandemic. Some of the variables were re-categorized in the logistic regression due to low frequency in specific categories. Both univariate and multivariable binary logistic regression was used to examine the factors associated with higher screen time during the COVID-19 pandemic. Both univariate and multivariable models showed that marital status and education were significant predictors of higher screen time during the COVID-19 pandemic. In univariate analysis, age group and occupation were also found to be substantial.

From the multivariable model, separated/divorced/widowed and singles were 3.65 times (aOR 3.65, 95% CI 1.34-9.94) and 2.23 times (aOR 2.23, 95% CI 1.28-3.89) more likely of higher screen time as compared to those who were married/cohabitation/common-law. People who completed college were 71% (aOR 0.29, 95% CI 0.09-0.89) less likely to have higher screen time than those with secondary or below educational qualifications.

Discussion

Since the COVID-19 pandemic is still ongoing, this is the first of its kind study, to our knowledge, conducted nationwide in Saudi Arabia on the impact of a pandemic on lifestyle changes.

The key findings of this study revealed healthy eating habits among the study participants. Having a meal home cooked at home was on the higher side during the COVID-19 pandemic compared to everyday life. However, unhealthy behaviors were also high, such as sitting for a long time and screen time. Retired people were 84% (aOR 0.16, 95% CI 0.03-0.78) less likely of higher physical activity as compared to working (≥40 hrs/week) professionals. Separated/divorced/widowed and singles were 3.65 times (aOR 3.65, 95% CI 1.34-9.94) and 2.23 times (aOR 2.23, 95% CI 1.28-3.89) more likely of

Table II. Univariate and multivariable logistic regression for predicting higher physical activity during a COVID-19 pandemic.

Characteristics		Univariate model		Multivariable model	
		cOR (95% CI)	*p*-value	aOR (95% CI)	*p*-value
Age group	18 to 24 years (Reference)	1.00		1.00	
	25 to 34 years	1.55 (0.98-2.47)	0.063	1.40 (0.72-2.72)	0.318
	35 to 49 years	1.11 (0.67-1.86)	0.686	1.24 (0.51-2.98)	0.637
	≥50 years	1.78 (0.86-3.70)	0.123	2.37 (0.78-7.26)	0.130
Gender	Female (Reference)	1.00		1.00	
	Male	1.21 (0.83-1.77)	0.325	1.07 (0.65-1.76)	0.781
Marital status	Married/Cohabitation/ Common-law (Reference)	1.00		1.00	
	Separated/Divorced/ Widowed	0.82 (0.27-2.53)	0.729	0.83 (0.26-2.65)	0.750
	Single	1.06 (0.72-1.56)	0.763	1.60 (0.87-2.92)	0.128
Education	Secondary or below (Reference)	1.00		1.00	
	College	0.68 (0.21-2.18)	0.511	0.58 (0.17-2.01)	0.390
	Associate degree	0.34 (0.07-1.55)	0.163	0.33 (0.07-1.58)	0.165
	Bachelor	0.88 (0.53-1.45)	0.609	0.73 (0.42-1.29)	0.283
	Graduate	1.06 (0.55-2.05)	0.860	0.80 (0.36-1.82)	0.602
Occupation	Working (≥40 hrs/week) (Reference)	1.00		1.00	
	Working (1-39 hrs/week)	0.70 (0.40-1.25)	0.229	0.69 (0.38-1.27)	0.234
	Self-employed	0.78 (0.15-4.04)	0.765	0.74 (0.13-4.08)	0.725
	Job seeking/Laid off	0.87 (0.47-1.63)	0.663	0.85 (0.40-1.79)	0.665
	Not in workforce	0.56 (0.26-1.20)	0.135	0.56 (0.22-1.39)	0.209
	Retired	0.23 (0.05-1.05)	0.058	0.16 (0.03-0.78)	**0.024**
	Student	0.54 (0.32-0.91)	**0.022**	0.56 (0.25-1.26)	0.163
BMI	Underweight (Reference)	1.00		1.00	
	Normal	3.45 (1.03-11.63)	**0.046**	3.29 (0.96-11.35)	0.059
	Overweight	4.32 (1.28-14.60)	**0.019**	4.40 (1.25-15.52)	**0.021**
	Obese	2.95 (0.84-10.36)	0.092	2.82 (0.77-10.33)	0.118
Practicing health professional	No (Reference)	1.00		1.00	
	Yes	1.04 (0.67-1.60)	0.864	0.92 (0.56-1.49)	0.724
Smoking	Regular smoker (Reference)	1.00		1.00	
	Occasional smoker	1.05 (0.38-2.88)	0.930	1.27 (0.43-3.72)	0.663
	Former smoker	0.96 (0.35-2.63)	0.941	1.12 (0.38-3.26)	0.837
	Non smoker	1.01 (0.56-1.84)	0.964	1.19 (0.61-2.35)	0.607
Chronic disease	No (Reference)	1.00		1.00	
	Yes	1.15 (0.78-1.70)	0.487	1.11 (0.72-1.69)	0.638
Covid status	Confirmed positive (Reference)	1.00		1.00	
	Likely, but not confirmed	0.89 (0.23-3.36)	0.862	0.93 (0.23-3.78)	0.916
	Not infected	1.01 (0.47-2.19)	0.978	1.06 (0.47-2.38)	0.893
	Don't know	0.71 (0.25-2.01)	0.524	0.70 (0.24-2.07)	0.525
Severity in the community	Severe (Reference)	1.00		1.00	
	Moderate	1.05 (0.59-1.89)	0.869	1.06 (0.56-2.00)	0.860
	Mild	1.13 (0.75-1.71)	0.563	1.12 (0.72-1.75)	0.621
Knowledge level score		1.01 (0.95-1.08)	0.744	0.99 (0.93-1.07)	0.888

higher screen time as compared to those who were married/cohabitation/common-law.

Secondly, there was an overall increase in physical activity among 24.8% of participants, whereas it decreased for 30.1% of the respondents. Due to this reduced physical activity, weight increased for 36.7% of the respondents. Similar findings were observed in previously conducted studies. For example, Chopra et al[5] conducted a cross-sectional study among 995 participants in India, and the results showed an improvement in healthy diet consumption, reduction in physical activity, and increased daily screen time among the study participants. Previous other published articles[9-11] also reported similar findings. Similarly, Gornicka et al[9] reported that COVID-19 had a negative effect on physical activity in adults. These results are consistent with a previous study in Canada[12] that reported a significant reduction in all physical activities in children and adolescents.

Table III. Univariate and multivariable logistic regression for predicting higher physical activity during a COVID-19 pandemic.

Characteristics		Univariate model		Multivariable model	
		cOR (95% CI)	*p*-value	aOR (95% CI)	*p*-value
Age group	18 to 24 years (Reference)	1.00		1.00	
	25 to 34 years	0.79 (0.53-1.19)	0.255	1.27 (0.69-2.35)	0.449
	35 to 49 years	0.54 (0.35-0.83)	**0.005**	1.11 (0.50-2.48)	0.796
	≥50 years	0.26 (0.12-0.54)	**0.000**	0.62 (0.21-1.84)	0.387
Gender	Female (Reference)	1.00		1.00	
	Male	0.84 (0.60-1.17)	0.310	0.86 (0.55-1.35)	0.507
Marital status	Married/Cohabitation/ Common-law (Reference)	1.00		1.00	
	Separated/Divorced/ Widowed	3.21 (1.24-8.31)	**0.017**	3.65 (1.34-9.94)	**0.011**
	Single	2.46 (1.74-3.47)	**<0.001**	2.23 (1.28-3.89)	**0.005**
Education	Secondary or below (Reference)	1.00		1.00	
	College	0.34 (0.12-0.95)	**0.039**	0.29 (0.09-0.89)	**0.031**
	Associate degree	0.95 (0.34-2.68)	0.926	0.60 (0.20-1.85)	0.378
	Bachelor	0.89 (0.56-1.39)	0.598	0.80 (0.48-1.35)	0.411
	Graduate	0.51 (0.28-0.94)	**0.030**	0.61 (0.28-1.32)	0.210
Occupation	Working (≥ 40hrs/wk) (Reference)	1.00		1.00	
	Working (1-39 hrs/wk)	1.12 (0.66-1.90)	0.678	0.97 (0.55-1.73)	0.926
	Self-employed	0.50 (0.09-2.68)	0.417	0.60 (0.10-3.54)	0.571
	Job seeking/Laid off	1.35 (0.75-2.41)	0.319	0.87 (0.43-1.77)	0.699
	Not in workforce	0.64 (0.33-1.25)	0.190	0.52 (0.23-1.16)	0.110
	Retired	0.47 (0.17-1.28)	0.140	0.63 (0.19-2.05)	0.438
	Student	1.80 (1.12-2.90)	**0.015**	1.05 (0.49-2.27)	0.900
BMI	Underweight (Reference)	1.00		1.00	
	Normal	0.91 (0.44-1.84)	0.784	1.01 (0.47-2.15)	0.977
	Overweight	0.99 (0.48-2.04)	0.984	1.64 (0.74-3.62)	0.223
	Obese	1.32 (0.62-2.81)	0.473	2.24 (0.97-5.15)	0.058
Practicing health professional	No (Reference)	1.00		1.00	
	Yes	0.83 (0.57-1.21)	0.343	0.77 (0.49-1.20)	0.245
Smoking	Regular smoker(Reference)	1.00		1.00	
	Occasional smoker	1.25 (0.51-3.06)	0.627	1.37 (0.51-3.67)	0.529
	Former smoker	1.44 (0.60-3.45)	0.412	1.62 (0.62-4.24)	0.322
	Non smoker	1.33 (0.80-2.23)	0.274	1.28 (0.69-2.37)	0.442
Chronic disease	No (Reference)	1.00		1.00	
	Yes	0.72 (0.51-1.01)	0.058	0.76 (0.52-1.11)	0.155
COVID-19 status	Confirmed positive (Reference)	1.00		1.00	
	Likely, but not confirmed	0.85 (0.27-2.69)	0.782	0.77 (0.22-2.72)	0.679
	Not infected	0.97 (0.48-1.96)	0.927	0.97 (0.45-2.08)	0.942
	Don't know	1.83 (0.75-4.48)	0.186	1.88 (0.72-4.92)	0.195
Severity in the community	Severe (Reference)	1.00		1.00	
	Moderate	1.15 (0.69-1.94)	0.591	1.12 (0.63-1.99)	0.703
	Mild	0.99 (0.68-1.43)	0.945	1.06 (0.70-1.60)	0.778
Knowledge level score		0.96 (0.90-1.01)	0.128	0.98 (0.92-1.04)	0.499

Note: cOR= crude Odds Ratio; aOR= adjusted Odds Ratio.

Among respondents, 36% considered their knowledge level on the novel coronavirus as very good, 43.5% said their knowledge level on how to prevent the spread of the novel coronavirus is excellent. Only 18.8% of the respondents thought they had absolutely adequate knowledge about the novel coronavirus. Similar findings were observed in knowledge, attitude, and practices studies conducted in Saudi Arabia. A study by Alhazmi et al[13] showed that the majority of the participants had good knowledge regarding the causative agent, mode of transmission, and complications. One study conducted in Saudi Arabia by Al-Hanawi et al[14] reported that the overall accuracy rate for the knowledge test was 81.64%.

The findings of this study were also consistent with other studies conducted in Malaysia[15] and China[16], which showed that overall public knowledge was 80.5%, and fear was present among the majority of the subjects.

A multicentric study conducted in the three Middle East countries of Saudi Arabia, Kuwait, and Jordan and that enrolled 1,208 participants revealed that the overall knowledge score among the three countries was 66.1%. The highest score was among Jordanians (70.3%), while public knowledge in Saudi Arabia was less than 70.3%[17,18].

Physical health, sleep quality, and quality of life improved for 21.9%, 28.5%, and 26.2% of the respondents, respectively. Whereas physical health, sleep quality, and quality of life decreased by 20.4%, 28.5%, and 33.3%, respectively. Similar to the current study, a previously published study was done by Kocevska et al[19] on sleep quality among 667 participants on the Netherlands sleep registry. The findings were similar to the current study; 20% of the good sleepers in pre-pandemic time experienced sleep disturbance during the pandemic time. Those with pre-pandemic sleep disturbances during pandemic got aggravated. Additionally, an online survey conducted in Saudi Arabia reported mild to moderate rates of anxiety among the general population and a significantly higher level of anxiety among married respondents[20].

The current study's findings showed that the ongoing COVID-19 pandemic has caused a significant impact on the lifestyle of the Saudi population. However, there are few limitations to the present study. These are self-reported parameters and are subjective in nature. Second, this being a cross-sectional study, the follow-up of the participants was not done.

Conclusions

The COVID-19 pandemic has had an impact on the lifestyle of the Saudi population. There has been a healthy shift in dietary habits inform of consuming home-cooked food. Nonetheless, there is also an unhealthy habits on the rise, such as lack of physical activity, prolonged sitting time, and increased screen time. This study's findings can be used by policymakers to devise health education and plans to overcome the mental health issues caused by the pandemic.

Conflict of Interest

The authors declare that they have no conflict of interest.

Acknowledgments

This research was supported by the Deanship of Scientific Research, Imam Mohammad Ibn Saud Islamic University (IMSIU), Saudi Arabia, Grant No. (21-13-18-054).

References

1) Worldometers.info. COVID-19 Coronavirus Pandemic. 2020 [Internet]. 2020. Available from: https://www.worldometers.info/coronavirus/
2) Tsang YK. The Coronavirus Impact on Daily Life in Hong Kong. Airshare 2021. Available at: https://airshare.air-inc.com/the-coronavirus-impact-on-daily-life-in-hong-kong.
3) World Health Organization. Coronavirus disease (COVID-19) advice for the public, 2020; Available from: https://www.who.int/emergencies/diseases/%0Anovel-coronavirus-2019/advice-for-public.
4) Zhang Y, Ma ZF. Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Liaoning Province, China: A cross-sectional study. Int J Environ Res Public Health 2020; 177.
5) Chopra S, Ranjan P, Singh V, Kumar S, Arora M, Hasan MS, Kasiraj R, Suryansh, Kaur D, Vikram NK, Malhotra A, Kumari A, Klanidhi KB, Baitha U. Impact of COVID-19 on lifestyle-related behaviours- a cross-sectional audit of responses from nine hundred and ninety-five participants from India. Diabetes Metab Syndr 2020; 14: 2021-2030.
6) Latha Narayanan, Mansi Pandit, Subhro Basu, Arijeet Karmakar, Vanshika Bidhan, Hrithik Kumar KB. Impact of Lockdown due to COVID-19 Outbreak : Lifestyle Changes and Public Health Concerns in India. Preprints 2020; 53: 1689-1699.
7) Bhutani S, Cooper JA. COVID-19-Related Home Confinement in Adults: Weight Gain Risks and Opportunities. Obesity (Silver Spring) 2020; 28: 1576-1577.
8) Al-Husseini N, Alqahtani A. COVID-19 pandemic's impact on eating habits in Saudi Arabia. J Public health Res 2020; 9: 354-360.
9) Górnicka M, Drywień ME, Zielinska MA, Hamułka J. Dietary and Lifestyle Changes During COVID-19 and the Subsequent Lockdowns among Polish Adults: A Cross-Sectional Online Survey PLife-COVID-19 Study. Nutrients 2020; 12: 2324.
10) Giustino V, Parroco AM, Gennaro A, Musumeci G, Palma A, Battaglia G. Physical activity levels and related energy expenditure during COVID-19 quarantine among the Sicilian active population: A cross-sectional online survey study. Sustain 2020; 12.
11) Papaspanos N. Effects of COVID-19 Home Confinement on Eating Behaviour and Physical Activity: Results of the ECLB-COVID19 International Online Survey. Kompass Nutr Diet 2021; 1: 19-21.
12) Moore SA, Faulkner G, Rhodes RE, Brussoni M, Chulak-Bozzer T, Ferguson LJ, Mitra R, O'Reilly N, Spence JC, Vanderloo LM, Tremblay MS. Impact of the COVID-19 virus outbreak on movement and play

behaviours of Canadian children and youth: a national survey. Int J Behav Nutr Phys Act 2020; 17: 85.

13) Alhazmi A, Ali MHM, Mohieldin A, Aziz F, Osman OB, Ahmed WAM. Knowledge, attitudes, and practices among people in Saudi Arabia regarding COVID-19: A cross-sectional study. J Public health Res 2020; 9: 345-353.
14) Al-Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, Abudawood Y, Alqurashi M, Kattan WM, Kadasah NA, Chirwa GC, Alsharqi O. Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. Front Public Health 2020; 8: 217.
15) Shi Y, Wang J, Yang Y, Wang Z, Wang G, Hashimoto K, Zhang K, Liu H. Knowledge and attitudes of medical staff in Chinese psychiatric hospitals regarding COVID-19. Brain Behav Immun Health 2020: 100064.
16) Person B, Sy F, Holton K, Govert B, Liang A; National Center for Inectious Diseases/SARS Community Outreach Team. Fear and stigma: the epidemic within the SARS outbreak. Emerg Infect Dis 2004; 10: 358-363.
17) Naser A, Dahmash EZ, Alwafi H, Alsairafi ZK, Rajeh A, Alhartani Y, Fawaz MT, Hamad S. Knowledge and practices towards COVID-19 during its outbreak: a multinational cross-sectional study. medRxiv 2020. Doi: https://doi.org/10.1101/2020.04.13.20063560.
18) Yap J, Lee VJ, Yau TY, Ng TP, Tor PC. Knowledge, attitudes and practices towards pandemic influenza among cases, close contacts, and healthcare workers in tropical Singapore: a cross-sectional survey. BMC Public Health 2010 ; 10: 442.
19) Kocevska D, Blanken TF, Van Someren EJW, Rösler L. Sleep quality during the COVID-19 pandemic: not one size fits all. Sleep Med 2020; 76: 86-88.
20) Alsaqri S, Alkwiese M, Aldalaykeh M, Hamzi MI, Mahdi MM, Shafie Z. Anxiety among the general population during Coronavirus-19 Disease in Saudi Arabia: Implications for a Mental Support Program. medRxiv 2020. Doi: https://doi.org/10.1101/2020.05.07.20090225.