

ORIGINAL RESEARCH:  
EMPIRICAL RESEARCH - QUANTITATIVE

# Health-promoting behaviour during the COVID-19 pandemic among Saudi Adults: A cross-sectional study

Rnda Ibrahim Ashgar 

Jazan University/College of Nursing,  
Jazan, Saudi Arabia

**Correspondence**

Rnda Ibrahim Ashgar, Jazan University/  
College of Nursing, Scheme 7, Jazan  
45142, Saudi Arabia.  
Email: rnAshgar@jazanu.edu.sa or  
rndaashgar@gmail.com

**Funding information**

This research received no specific grant  
from any funding agency in the public,  
commercial, or not-for-profit sectors.

## Abstract

**Aims:** To evaluate health-promoting behaviour among Saudi adults in the Jazan region during the COVID-19 pandemic.

**Design:** Cross-sectional study design.

**Methods:** Saudi adults ( $N = 305$ ) completed an online survey from 23 April to 5 July 2020. The survey comprised demographic/social factors, COVID-19 pandemic-related factors and the Health-Promoting Lifestyle Profile-II.

**Results:** On average, participants reported participating in health-promoting behaviour 'sometimes'. Only years of education was associated with participation in health-promoting behaviour generally. Nutritional behaviours were positively correlated with sex, age and having a job before and/or after the pandemic and negatively correlated with the number of people in the household. Interpersonal relationships increased with age and years of education. Interpersonal relationships and stress management decreased among those who reported that the pandemic had negatively affected their income.

**Conclusion:** Our results indicated that COVID-19 factors are associated with Saudi adults' adoption of health-promoting behaviour.

## KEYWORDS

adult nursing, health promotion, health risk management, international health, lifestyle, risk management

## What problem did the study address?

- This was the first study to examine the effect of COVID-19-related factors on health-promoting behaviour among Saudi adults.

## What were the main findings?

- There are relationships between some social- and COVID-19-related factors and health-promoting behaviour.

## Where and on whom will the research have impact?

- The findings can help healthcare professionals and researchers recognize the impact of COVID-19 on adults' adoption of health-promoting behaviour.

## 1 | INTRODUCTION

On 31 December 2019, the Chinese authorities reported that they had identified a new virus that caused pneumonia in Wuhan City, Hubei Province of China (World Health Organization [WHO], 2020a). The new virus belongs to coronaviruses—a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East respiratory syndrome and severe acute respiratory syndrome. The disease was named 'coronavirus disease 2019' (COVID-19). The outbreak was declared a public health emergency of international concern on 30 January 2020.

The COVID-19 pandemic is a global health crisis and the greatest challenge the world has faced since World War II (United Nations Development Programme [UNNP], 2020). Since its emergence in Asia, the virus has spread to every continent except Antarctica (UNNP, 2020). It has disturbed economic stability, increased individuals' stress levels and disrupted the daily routines of many families (Carroll et al., 2020). As of 31 August 2020, nearly 25 million cases and 800,000 deaths had been reported globally since the start of the outbreak (WHO, 2020b). In Saudi Arabia, the minister of health, Dr. Tawfig AlRabiah, reported on 20 April 2020 that the cases were rising daily and exceeded the minimum expected level (10,000 cases; AlRabiah, 2020). The number of cases was expected to increase to 200,000 cases (AlRabiah, 2020). As of 2 September 2020, the total number of confirmed cases in Saudi Arabia was 317,486 (9096 per million), and the fatality rate was 1.2% (WHO, 2020c).

## 2 | BACKGROUND

Like other countries, Saudi Arabia is racing to slow the spread of the virus by testing and treating patients, performing contact tracing, limiting travel, quarantining citizens, isolating cities and cancelling large gatherings such as sporting events, concerts, prayers in mosques and schools. One of the main strategies to control the spread of the disease that was implemented in Saudi Arabia is the curfew, which was implemented in several regions across the country in different levels. The Jazan region, south of Saudi Arabia and just north of Yemen, started a lockdown curfew on 2 March 2020—from 6:00 PM to 3:00 AM for the whole region. However, a few days later, with the increasing number of cases across the country, the curfew changed in the Jazan region from 6:00 AM to 6:00 PM. Later on, some cities and towns were under curfew for 24 h. Unlike other regions in Saudi Arabia, Jazan is a border area with Yemen, which is a combat zone and a zone for illegal immigrants, which creates an additional burden on the government to fight the new disease and respond to the health emergency.

Public health emergencies may affect the health, safety and well-being of both individuals and communities (Pfefferbaum & North, 2020). These effects may translate into a range of emotional reactions such as distress or psychiatric conditions, unhealthy behaviours and noncompliance with public health directives. Extensive research on disaster mental health has established that emotional distress is ubiquitous in affected populations, which are expected to be true

in populations affected by the COVID-19 pandemic (Pfefferbaum & North, 2020). Some groups of the population may be more vulnerable than others to the psychosocial effects of this pandemic. In particular, people who contract the disease, older people, people with compromised immune function, those living or receiving care in congregate settings and people with pre-existing medical, psychiatric or substance use problems are at increased risk for adverse psychosocial outcomes (Pfefferbaum & North, 2020). Healthcare providers are also particularly vulnerable to the psychosocial outcomes in the current pandemic, given their risk of exposure to the virus, concern about infecting and caring for their loved ones, shortages of personal protective equipment and longer work hours. Prevention efforts such as promoting healthy behaviours, screening for health problems, psychoeducation and psychosocial support should focus on these groups, particularly for adverse psychosocial outcomes.

Health promotion involves controlling all behaviours that might affect one's health and adopting behaviours that serve to maintain and raise individuals' wellness levels (Walker et al., 1987). Pender and Pender (1996) defined health-promoting behaviour as a multidimensional pattern that involves six aspects: nutrition, physical activity, stress management, health responsibility, interpersonal relationships and spiritual growth. While health-promoting behaviour is an essential element to stay healthy and fight the COVID-19 pandemic, it could also be affected by the preventive measures taken to control it, which will bring their own problems after COVID-19.

Exploring the effect of the current COVID-19 pandemic on health-promoting behaviour among the population is a necessary step toward planning for life after the COVID-19 pandemic and developing primary preventive measures as early as possible to reduce the damages that it may cause.

## 3 | THE STUDY

### 3.1 | Aims

This study investigated the effect of the COVID-19 pandemic on health-promoting behaviour among Saudi adults in Jazan. The objectives were to describe the current state of health-promoting behaviour among the adult population in the Jazan region, Saudi Arabia and the effect of selected social- and COVID-19-related factors on the current state of health-promoting behaviour.

### 3.2 | Design

We employed a cross-sectional study design.

### 3.3 | Participants

A convenience sample of 305 Saudi adults in the Jazan region, Saudi Arabia, participated in this study to detect a medium effect

size ( $ES = 0.15$ ) at a power of 0.99 and for nominal alpha set at 0.05. Inclusion criteria included adults aged 15 years or older, Saudi, living in the Jazan region and able to read and write in Arabic. Participants completed an online survey comprising three sections: demographic and social factors, COVID-19 pandemic-related factors and the Health-Promoting Lifestyle Profile-II (HPLP-II).

### 3.4 | Instrument

Demographic and social factors in this study included age, sex, years of education, number of people in the household and having a chronic disease. All variables were measured on interval scales except for sex and having a chronic disease, which were measured on categorical scales. COVID-19-related factors include having a job before the pandemic, having a job after the pandemic, having been diagnosed with COVID-19, having a family member or a friend who was diagnosed with COVID-19, being a healthcare worker, hours of watching COVID-19 news, the type of curfew in their town, whether they believe that the curfew has negatively affected their income and whether they believe that the curfew negatively impacted their health behaviours. These factors were measured on dichotomous scales except for hours of watching COVID-19 news, which was measured on an interval scale. The HPLP-II was used to measure health-promoting behaviour.

The 52-item HPLP-II comprises a total scale and six subscales to measure behaviours in the theorized dimensions of health-promoting lifestyles (Walker et al., 1987). HPLP-II scores can range from 52 to 208, and the total score is determined by calculating the mean of the 52 items (Walker et al., 1987). Higher scores indicate greater participation in the HPB.

### 3.5 | Data collection

Data were collected from 23 April to 5 July 2020. Data were collected electronically via an anonymous link distributed via WhatsApp broadcasting and snowball sampling. Inclusion criteria were stated in the introduction of the survey, and a brief informed consent was required to proceed to the first question. The survey was available in Arabic.

### 3.6 | Ethical considerations

The recruitment process started after obtaining approval from the Ethical Committee of Jazan University-Nursing College in April 2020. In the covering letter of the survey, the study purpose and aim were described. Responding to the survey was optional and anonymous; throughout the study, respondents' anonymity was fully maintained.

### 3.7 | Data analysis

The IBM SPSS Statistics (V25.0) computer program was used to analyse the data. Descriptive statistics (means, standard deviations (SDs), minimum, maximum and percentages) were used to describe the sample and main concepts. One-sample  $t$  tests were performed to estimate the 95% confidence intervals and population means.

Pearson's  $r$  correlation tests were conducted to identify the variables that correlated with each subscale of health-promoting behaviour and the overall scale. Then, multiple regression analyses were used to assess what factor was most affected each health-promoting behaviour subscale and the overall scale by using only variables that correlated with each subscale and the overall scale. Two multiple regression analyses were performed for each scale/subscale to evaluate the effect of social factors (i.e., age, sex, years of education, number of people in the household and having any chronic disease(s)) and COVID-19-related factors (i.e., having a job before the pandemic, having a job after the pandemic, having been diagnosed with COVID-19, having a family member or a friend who was diagnosed with COVID-19, being a healthcare worker, hours of watching COVID-19 news, the type of the curfew in their town before Ramadan, whether they believed that the curfew had negatively affected their income and whether they believed that the curfew has negatively affected their health behaviours) on health-promoting behaviour. Chi-squared ( $\chi^2$ ) tests were conducted to assess the association between the type of curfew and believing that the pandemic had impacted their health-promoting behaviour. All the estimated population means and any detected associations between the variables were considered significant when  $p < .05$  (Munro, 2005).

### 3.8 | Validity and reliability

The HPLP-II has been validated in several studies and used among a variety of populations and cultures. Further, the reliability and validity of the Arabic version of HPLP-II was established in several studies (Al-Khawaldeh, 2014; Haddad et al., 1998). Previous research reported Cronbach's alpha that ranged 0.89 (Haddad et al., 1998) to 0.92 (Al-Khawaldeh, 2014) for the total scale and 0.70 to 0.88 (Al-Khawaldeh, 2014) and 0.85 to 0.60 (Haddad et al., 1998) for the subscales. Content validity was ascertained by the evaluation of the translated version of the HPLP-II by four experts who were selected for their experience in public health and nursing education in Jordan (Haddad et al., 1998). All HPLP-II items achieved a 70% to 100% interrater agreement (Haddad et al., 1998). Construct validity was determined by factor analysis, which confirmed the six subscales (Haddad et al., 1998).

## 4 | RESULTS

### 4.1 | Demographic characteristics

The mean (SD) age of the participants in this study was 32.13 (10.86) years. Most were women (72.4%), married (52.1%) and from Farasan

Island (30.5%) or Jazan city (26.9%). Table 1 presents more demographic characteristics.

## 4.2 | Social factors

The mean number of people in the household was 6.46 (*SD* 3.43). Most participants had higher education (mean = 14.81, *SD* 2.92) and had not been diagnosed with a chronic disease (62%). Among all the listed chronic diseases, most reported hypertension (10.8%), asthma (8.9%) or diabetes (7.9%). Table 2 provides more details concerning social factors.

TABLE 1 Demographic characteristics (*N* = 305)

Variable	Mean (SD)
Age	32.13 (10.863)
Variable	Frequency (percent)
Gender	
Male	83 (27.2)
Female	222 (72.8)
City	
Gizan	82 (26.9)
Sabia	36 (11.8)
Samtah	11 (3.6)
Abu-Arish	20 (6.6)
Ahad-Almasareha	35 (11.5)
Baish	3 (1.0)
Alaredha	3 (1.0)
Damad	13 (4.3)
Farasan	93 (30.5)
Altowal	3 (1.0)
Harooob	2 (0.7)
Faifa	4 (1.3)
Marital status	
Single	130 (42.6)
Married	159 (52.1)
Separated	1 (0.3)
Divorced	11 (3.6)
Widow	4 (1.3)
Annual income	
Under 5000 SAR	67 (22.0)
5000–9999 SAR	32 (10.5)
10,000–14,999 SAR	71 (23.3)
15,000–19,000 SAR	35 (11.5)
≥20,000 SAR	17 (5.6)
Prefer not to answer	83 (27.2)

## 4.3 | COVID-19-related factors

Most participants were under the 12-h curfew (94.8%) and had not been diagnosed with COVID-19 (99%). The mean COVID-19 news hour per day was 2.69 (*SD* 5.18). While 53.8% of participants had a job before the pandemic, this increased to 59.3% after the pandemic. Thus, most participants believed that the COVID-19 pandemic did not negatively affect their income (87.2%) nor affected their health-promoting behaviour (82%). Table 3 presents more detail concerning COVID-19-related factors.

## 4.4 | Data concerning health-promoting behaviour

On average, participants reported engaging in health-promoting behaviour 'sometimes' (mean = 2.48, range = 1–4). Health-promoting behaviour subscales were further analysed to determine the most practiced domain of health-promoting behaviour among adults in the Jazan region during the pandemic. Spiritual growth (mean = 3.09, *SD* 0.56) was the most practiced dimension of health-promoting behaviour among this sample, while physical exercise (mean = 1.98, *SD* 0.61) was the least practiced dimension. Table 4 provides the mean, minimum and maximum for the total scale and each subscale of health-promoting behaviour.

TABLE 2 Social factors (*N* = 305)

Variable	Mean (SD)
Number of people in the household	6.46 (3.431)
Years of Education	14.81 (2.921)
Variable	Frequency (percent)
Have a previous medical history of:	
Hypertension	33 (10.8)
Asthma	27 (8.9)
Diabetes	24 (7.9)
Arthritis	16 (5.2)
Hyper/hypothyroidism	13 (4.3)
Digestive ulcer	12 (3.9)
Depression and/or anxiety	10 (3.3)
High cholesterol level	10 (3.3)
Sickle cell anemia	7 (2.3)
Kidney or liver disease	4 (1.3)
Thalassemia	3 (1.0)
Cancer	3 (1.0)
Chronic obstructive pulmonary disease	2 (0.7)
Other	4 (1.3)
Have one or more than one of the above listed medical conditions	116 (38.0)

#### 4.5 | Correlation between health-promoting behaviour and social- and COVID-19-related factors

Pearson's *r* correlation coefficient was used to examine the relationships among social factors, COVID-19-related factors and health-promoting behaviour. Among all the selected social factors, only years of education was significantly associated with the total scale of health-promoting behaviour ( $r = 0.120, p = .036$ ). Nutrition, spiritual growth and interpersonal relationships subscales had significant associations with some social factors. The nutrition subscale was positively associated with age ( $r = 0.178, p = .002$ ) and sex ( $r = 0.129, p = .024$ ) and negatively associated with the number of people in the household ( $r = -0.126, p = .028$ ). Spiritual growth was positively associated with years of education ( $r = 0.147, p = .010$ ), while interpersonal relationships were positively associated with age ( $r = 0.120, p = .036$ ) and years of education ( $r = 0.141, p = .014$ ).

TABLE 3 COVID-19-related factors ( $N = 305$ )

Variable	Mean (SD)
COVID19 News hour per day	2.69 (5.183)
Variable	Frequency (percent)
Have job before COVID-19	164 (53.8)
Have job after COVID-19	181 (59.3)
COVID-19 did not affect their income	266 (87.2)
Type of curfew	
06:00 am to 03:00 pm	389 (94.8)
24 h	16 (5.2)
Have been diagnosed with COVID-19	3 (1.0)
Has family member who has been diagnosed with COVID-19	2 (0.7)
Being a Health care worker	56 (18.4)
Do you think the curfew has impacted your health behaviour?	
Yes	55 (18)
No	250 (82)

TABLE 4 Health-promoting behaviour-related data ( $N = 305$ )

Health-promoting behaviour	Actual range				Possible range
	Minimum	Maximum	Mean <sup>a</sup>	SD	1-4
Health-promoting behaviour (total scale)	1.13	3.87	<b>2.48</b>	.47	1-4
Health responsibility subscale	1.00	4.00	<b>2.26</b>	.62	1-4
Physical activity subscale	1.00	4.00	<b>1.98</b>	.61	1-4
Nutrition subscale	1.11	3.78	<b>2.29</b>	.54	1-4
Spiritual growth subscale	1.22	4.00	<b>3.09</b>	.56	1-4
Interpersonal relationships subscale	1.22	4.00	<b>2.76</b>	.59	1-4
Stress management subscale	1.00	4.00	<b>2.50</b>	.55	1-4

Note:  $p < .0001$  (marked in bold).

<sup>a</sup>One-sample *t*-test.

The total scale of health-promoting behaviour was not associated with any of the COVID-19-related factors. Nevertheless, some of the COVID-19-related factors were significantly associated with nutrition, interpersonal relationships and stress management subscales. The nutrition subscale was positively associated with having a job before COVID-19 and having a job after COVID-19 ( $r = 0.170, p = .003$ ) and ( $r = 0.140, p = .014$ ), respectively. Interpersonal relationships and stress management subscales were both negatively associated with having income being affected by the COVID-19 pandemic ( $r = -0.152, p = .008$ ) and ( $r = -0.134, p = .020$ ), respectively. Table 5 provides more detail on correlated variables with health-promoting behaviour.

#### 4.6 | Effect of social- and COVID-19-related factors on health-promoting behaviour

Two multiple regression analyses were performed for each subscale and the overall scale to evaluate the effect of social- and COVID-19-related factors on health-promoting behaviour. For both social- and COVID-19-related factors, none of the models revealed a significant effect on the total scale of health-promoting behaviour or its subscales, except for the nutrition subscale.

For social- and COVID-19-related factors, the models revealed 3% variation ( $F = 3.319, p = .006$ ) and 2% variation ( $F = 1.958, p = .044$ ) on the nutrition subscale, respectively. However, none of the social factors or COVID-19-related factors had a significant partial effect on nutrition.

Furthermore, a chi-square test was performed to evaluate the association between the type of curfew and believing that the pandemic had impacted their health-promoting behaviour. The analysis indicated that people who were in 24-h curfew towns were 2.939-times more likely to report that the curfew had impacted their health-promoting behaviour. In other words, people who were in 24-h curfew towns were 74.61% more likely to report that their health-promoting behaviour was affected compared with those who were in 12-h curfew towns.

TABLE 5 Correlation between health-promoting behaviour and social/COVID-19-related factors (N = 305)

	Sex	Age	Education	Number of people in the house	Work before COVID-19	Work after COVID-19	Affected income	Total HPB	Nutrition	Stress management	Spiritual growth	Interpersonal relations	
Sex	r												
	p												
Age	r	.384**	1										
	p	.000											
Education	r	.041	.128*	1									
	p	.480	.025										
Number of people in the house	r	-.140*	-.160**	-.064	1								
	p	.014	.005	.263									
Work before COVID-19	r	.390**	.603**	.225**	-.235**	1							
	p	.000	.000	.000	.000								
Work after COVID-19	r	.386**	.559**	.259**	-.179**	.812**	1						
	p	.000	.000	.000	.002	.000							
Affected income	r	.097	.018	-.079	.015	.079	.167	.057	1				
	p	.092	.756	.169	.799	.320							
Total HPB	r	.054	.041	.120*	-.079	.059	-.086	.042	-.086	1			
	p	.351	.474	.036	.168	.308	.133	.469	.133				
Nutrition	r	.129*	.178**	.101	-.126*	.170**	-.046	.140*	-.046	.821**	1		
	p	.024	.002	.078	.028	.003	.426	.014	.426	.000			
Stress management	r	.031	-.073	.075	-.059	-.048	-.134*	-.053	-.134*	.779**	.569**	1	
	p	.593	.203	.193	.301	.407	.020	.356	.020	.000	.000		
Spiritual growth	r	.015	.006	.147*	-.085	.027	-.060	.039	-.060	.829**	.576**	.652**	1
	p	.790	.918	.010	.138	.639	.293	.501	.293	.000	.000	.000	
Interpersonal relations	r	.059	.120*	.141*	-.068	.077	-.152**	.099	-.152**	.790**	.528**	.705**	1
	p	.308	.036	.014	.240	.181	.008	.084	.008	.000	.000	.000	

\*\*Correlation is significant at the 0.01 level (2-tailed).; \*Correlation is significant at the 0.05 level (two-tailed).

## 5 | DISCUSSION

This study assessed the effect of the COVID-19 pandemic on health-promoting behaviour among adults in Jazan, Saudi Arabia. On average, participants reported participating in health-promoting behaviour 'sometimes'. Most subscales were practiced 'sometimes' except for physical exercise, which was reported as 'never', and spiritual growth, which was reported as 'often'. This finding is consistent with previous research indicating that physical exercise is the least practiced dimension of health-promoting behaviour, while spiritual growth is the most practiced dimension among adults (Aqtash & Servellen, 2013). However, the lack of previous research among Saudi adults limits the comparability of the findings with the state of health-promoting behaviour before the COVID-19 pandemic.

Social factors such as age, sex, years of education, number of people in the household and having a chronic disease were tested for their correlation with and effect on health-promoting behaviour total scale and each subscale. Only years of education were significantly associated with participation in health-promoting behaviour, implying that the higher one's education level, the greater their adoption of health-promoting behaviour. Men were more likely to adopt healthy nutritional behaviours than were women, and they increased as age increased. In contrast, adopting healthy nutritional behaviours decreased as the number of people in the household increased. Interpersonal relationships and spiritual growth were other dimensions of health-promoting behaviour that were associated with some social factors. Interpersonal relationships increased with age and years of education. This was similar to spiritual growth, which increased as the years of education increased.

Previous research has supported the effect of several social factors on health-promoting behaviour among adults. For example, being employed, stress level, having a chronic disease and interpersonal support had direct effects on health-promoting behaviour (Cho et al., 2014; Edmonds, 2010; Enjazab et al., 2012; Hurlbut et al., 2011; Nazari et al., 2016; Tsai et al., 2014). Although associations between some of these factors and health-promoting behaviour were seen in this study, the results did not support the effect of these social factors on health-promoting behaviour. Only nutritional behaviours were significantly predicted by social factors, where the models revealed only a 3% variation.

COVID-19-related factors were hypothesized to be associated with and have an effect on the total scale of health-promoting behaviour and each subscale. Although these factors were not significantly associated with the total scale of health-promoting behaviour and did not affect health-promoting behaviour in this sample, these factors were significantly associated with the nutrition, interpersonal relationship and stress management subscales. For example, adopting healthy nutritional behaviours increased among those who reported having a job before the pandemic and among those who reported

having a job after the pandemic. In contrast, interpersonal relationships and stress management decreased among those who reported that the pandemic had negatively affected their income. However, COVID-19 is much more than a health crisis. People may not be only concerned about their health and getting COVID-19 but also about their social and financial life during and after the pandemic.

According to Mattioli et al. (2020), one important consequence of implementing a curfew is a change in lifestyle that mainly reduces physical exercise and fosters an unhealthy diet. This was supported by the current findings, as people who were under a 24-h curfew had a higher chance of reporting that the pandemic had negatively impacted their health-promoting behaviour. Similarly, physical exercise was reduced during the pandemic among Canadian (Lesser & Nienhuis, 2020) and Chinese (Wang et al., 2020) populations. Changing eating habits/routines during the COVID-19 pandemic was also reported among Chinese (Wang et al., 2020) and Canadian (Caroll et al., 2020) populations.

### 5.1 | Limitations and strengths

The findings should be viewed in the context of the following limitations. First, using cross-sectional data collection and snowball sampling may limit generalizability of the findings to other adults in the Jazan region, Saudi Arabia. A lack of research addressing health-promoting behaviour among adults in Saudi Arabia, and specifically in the Jazan region, also limits our ability to compare these findings. Moreover, the use of self-reported data collection methods may induce a social desirability response bias.

However, the reliability of this dataset has been tested and shown to be acceptable. The study was also evaluated by the Strengthening the Reporting of Observational Studies in Epidemiology Statement: guidelines for reporting observational studies (Von Elm et al., 2007) to enhance its validity. To our knowledge, this was the first study to examine the impact of COVID-19-related factors on health-promoting behaviour among adults in Saudi Arabia. Our results indicate that COVID-19 factors are associated with adopting health-promoting behaviour. The data from this study may help healthcare professionals and researchers recognize the impact of the COVID-19 pandemic on adults' adoption of health-promoting behaviour. These findings can also assist nursing researchers and healthcare professionals in planning for life after the pandemic. The findings contribute to the implementation of health programs aimed at promoting health-promoting behaviour among adults in the Jazan region of Saudi Arabia.

Future research would benefit from an interventional perspective and the inclusion of comparative groups. Future intervention studies and health promotion programs are highly recommended to promote individuals' health. Communities and societies need to prepare for life after the pandemic, considering the bio-psycho-social impact that the pandemic has caused.

## 6 | CONCLUSION

The current findings highlight the potential relationships between social- and COVID-19-related factors and health-promoting behaviour. Compared with their counterparts, men, those with a higher education level, those living with fewer people in the household, those with a job and those with a stable income were more likely to adopt one or more of the health-promoting behaviours. Consequently, we suggest that nurses and healthcare workers pay close attention to enhancing health-promoting behaviour in adults considering the impact of the pandemic on the bio-psycho-social factors. Societies need to start planning for and treating the complications that the pandemic has caused. A national action supporting health-promoting behaviour is mandatory to encourage people to return to a healthy lifestyle. This action has to be stronger at the lower socio-economic level, where people may have experienced a higher degree of burden from the restrictions compared with their wealthier counterparts.

### ACKNOWLEDGMENTS

The author would like to acknowledge the assistance of Dr. Arshad Jaweed who provided insight and expertise that greatly improved the paper. We would also like to thank Editage ([www.editage.com](http://www.editage.com)) for English language editing.

### CONFLICT OF INTEREST

No conflict of interest has been declared by the author.

### AUTHOR CONTRIBUTIONS

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

### PEER REVIEW

The peer review history for this article is available at <https://publons.com/publon/10.1111/jan.14863>.

### ORCID

Rnda Ibrahim Ashgar  <https://orcid.org/0000-0002-3395-5853>

### REFERENCES

- Al-Khawaldeh, O. (2014). Health promoting lifestyles of Jordanian university students. *International Journal of Advanced Nursing Studies*, 3(1), 27–31.
- AlRabiah, T. (2020). *COVID-19 updates in Saudi Arabia, speech on the Saudi One channel*. April 20, 2020.
- Aqtash, S., & Van Servellen, G. (2013). Determinants of health-promoting lifestyle behaviors among Arab immigrants from the region of the Levant. *Research in Nursing & Health*, 36(5), 466–477. <https://doi.org/10.1002/nur.21555>.
- Carroll, N., Sadowski, A., Laila, A., Hruska, V., Nixon, M., Ma, D. W. L., & Haines, J. (2020). The impact of COVID-19 on health behavior, stress, financial and food security among middle to high income Canadian families with young children. *Nutrients*, 12(8), 2352.
- Cho, J. H., Jae, S. Y., Choo, I. L., & Choo, J. (2014). Health-promoting behaviour among women with abdominal obesity: A conceptual link to social support and perceived stress. *Journal of Advanced Nursing*, 70(6), 1381–1390. <https://doi.org/10.1111/jan.12300>.
- Edmonds, J. C. (2010). The relationship of stress to health-promoting behaviors of college-educated African American women. *Bariatric Nursing and Surgical Patient Care*, 5, 305–312.
- Enjezab, B., Farajzadegan, Z., Taleghani, F., Aflatoonian, A., & Morowatisharifabad, M. A. (2012). Health promoting behaviors in a population-based sample of middle-aged women and its relevant factors in Yazd, Iran. *International Journal of Preventive Medicine*, 3(1), 191–198.
- Haddad, L. G., Al-Ma'aitah, R. M., Cameron, S. J., & Armstrong-Stassen, M. (1998). An Arabic language version of the Health Promotion Lifestyle Profile. *Public Health Nursing*, 15(2), 74–81.
- Hurlbut, J. M., Robbins, L. K., & Hoke, M. M. (2011). Correlations between spirituality and health-promoting behaviors among sheltered homeless women. *Journal of Community Health Nursing*, 28(2), 81–91. <https://doi.org/10.1080/07370016.2011.564064>
- Lesser, I. A., & Nienhuis, C. P. (2020). The impact of COVID-19 on physical activity behavior and well-being of Canadians. *International Journal of Environmental Research and Public Health*, 17(11), 3899. <https://doi.org/10.3390/ijerph17113899>
- Mattioli, A. V., Puviani, M. B., Nasi, M., & Farinetti, A. (2020). COVID-19 pandemic: The effects of quarantine on cardiovascular risk. *European Journal of Clinical Nutrition*, 74(6), 852–855. <https://doi.org/10.1038/s41430-020-0646-z>
- Munro, B. H. (2005). *Statistical methods for health care research* (5th ed.). : Lippincott Williams, Wilkins.
- Nazari, M., Farmani, S., Kaveh, M. H., & Ghaem, H. (2016). The effectiveness of lifestyle educational program in health promoting behaviors and menopausal symptoms in 45–60-year-old women in Marvdasht, Iran. *Global Journal of Health Sciences*, 8(10), 55414. <https://doi.org/10.5539/gjhs.v8n10p34>
- Pender, N. J., & Pender, A. R. (1996). *Health promotion in nursing practice* (3rd ed.). Appleton & Lange.
- Pfefferbaum, B., & North, C. (2020). Mental health and the Covid-19 pandemic. *The New England Journal of Medicine*, <https://doi.org/10.1056/NEJMp2008017>
- Tsai, H. M., Cheng, C. Y., Chang, S. C., Yang, Y. M., & Wang, H. H. (2014). Health literacy and health-promoting behaviors among multiethnic groups of women in Taiwan. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 43(1), 117–129. <https://doi.org/10.1111/1552-6909.12269>
- United Nations Development Programme. (2020). *COVID-19 pandemic*. Retrieved from <https://www.undp.org/content/undp/en/home/coronavirus.html>
- Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gotsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. *Lancet*, 370(9596), 1453–1457. <https://doi.org/10.1136/bmj.39335.541782.AD>
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. *Nursing Research*, 36, 76–81.
- Wang, X., Lei, S. M., Le, S., Yang, Y., Zhang, B., Yao, W. U., Gao, Z., & Cheng, S. (2020). Bidirectional influence of the COVID-19 pandemic lockdowns on health behaviors and quality of life among Chinese adults. *International Journal of Environmental Research and Public Health*, 17(15), 5575.
- World Health Organization. (2020). *Rolling updates on coronavirus disease (COVID-19)*. Retrieved from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>



World Health Organization. (2020b). *Coronavirus disease 2019 (COVID-19) weekly epidemiological updates*. Retrieved from [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200831-weekly-epi-update-3.pdf?sfvrsn=d7032a2a\\_4](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200831-weekly-epi-update-3.pdf?sfvrsn=d7032a2a_4)

World Health Organization. (2020c). *Corona tracker*. Retrieved from <https://www.coronatracker.com/country/saudi-arabia/>

**How to cite this article:** Ashgar RI. Health-promoting behaviour during the COVID-19 pandemic among Saudi Adults: A cross-sectional study. *J Adv Nurs*. 2021;77:3389–3397. <https://doi.org/10.1111/jan.14863>

The *Journal of Advanced Nursing (JAN)* is an international, peer-reviewed, scientific journal. *JAN* contributes to the advancement of evidence-based nursing, midwifery and health care by disseminating high quality research and scholarship of contemporary relevance and with potential to advance knowledge for practice, education, management or policy. *JAN* publishes research reviews, original research reports and methodological and theoretical papers.

For further information, please visit *JAN* on the Wiley Online Library website: [www.wileyonlinelibrary.com/journal/jan](http://www.wileyonlinelibrary.com/journal/jan)

**Reasons to publish your work in *JAN*:**

- High-impact forum: the world's most cited nursing journal, with an Impact Factor of 2.561 – ranked 6/123 in the 2019 ISI Journal Citation Reports © (Nursing; Social Science).
- Most read nursing journal in the world: over 3 million articles downloaded online per year and accessible in over 10,000 libraries worldwide (including over 6,000 in developing countries with free or low cost access).
- Fast and easy online submission: online submission at <http://mc.manuscriptcentral.com/jan>.
- Positive publishing experience: rapid double-blind peer review with constructive feedback.
- Rapid online publication in five weeks: average time from final manuscript arriving in production to online publication.
- Online Open: the option to pay to make your article freely and openly accessible to non-subscribers upon publication on Wiley Online Library, as well as the option to deposit the article in your own or your funding agency's preferred archive (e.g. PubMed).