Original article

The Impact of Precautionary Lockdown Measures During Covid-19 on Eating Behaviour and Lifestyle

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Abstract. *Background:* Eating behaviour and lifestyle are highly susceptible to changes in the individual's external environment. COVID-19 pandemic resulted in policies that severely impacted individual habits and daily routines. Growing literature highlights the adverse psychological impact of COVID-19 on eating behaviour and lifestyle. *Methods:* This study aimed to assess eating behaviour and lifestyle in Saudi Arabia during the strict lockdown. A self-reported online questionnaire was used to assess eating behaviour and lifestyle changes, including physical activity, sleep, and digital device use compared to that pre-lockdown. *Results:* A total of 1,860 participants completed the questionnaire. Weight gain was reported by 31%, whereas 41% reported decreased physical activity. The use of digital devices increased by 70%, with 59% of participants reporting symptoms of digital eyestrain. Mostly, 72% reported decreased fast-food delivery, mainly due to fear of contracting the virus. This decrease paralleled a 66% increase in home cooking. On the contrary, 15% reported weight loss, and 21% increased their physical activity. *Conclusion:* These findings provide important insight into the effects of COVID-19-related lockdown on eating behaviour and lifestyle.

Key words: COVID-19; pandemic; lockdown; eating behaviour; lifestyle; digital eye strain

Introduction

The COVID-19 pandemic has affected all communities worldwide from an economical, medical, and mental perspective. It disrupted everyday living where eating behaviours and lifestyle, such as physical activity, sleep, screen time, changed due to the rapidly changing circumstances (1). This pandemic novelty, uncertainty, and elevated health concerns impacted individuals' mental health and resulted in increased stress and anxiety (2). The psychological burden of COVID-19 may outweigh its medical burden, where some people tend to experience stress and anxiety regardless of infection status (3). During periods of stress, some people tend to comfort themselves with food. These comforting foods are usually calorie-dense and associated with rewarding and pleasant experiences that individuals aim to achieve (4). The significant impact of stress on adaptive behavioural mechanisms in brain reward regions, whereby activation of these regions, drives cravings for highly palatable calorie-dense food (5-7). Lockdown and home isolation are preventive measures adopted by governments to mitigate the spread of COVID-19. These measures negatively influenced eating behaviour and lifestyle (3, 8). During the lockdown, people tend to eat more snacks and sugary drinks (1, 9) and stocking up on food due to fear of food shortage (10). Many individuals were working from home with limited physical activity (10). Physical activity has decreased considerably during lockdown compared to that pre-lockdown (11). Governments implemented restrictions including distance education and remote working, closed all crowded recreational facilities, and

encouraged social distancing. These restrictions increased screen time and electronic digital device usage due to mandatory indoor living (9, 12). The majority of indoor activities are screen-related; this includes computers, smartphones, TV, tablets, and videogames. In Saudi Arabia, the use of business and education online platforms, i.e. 'Microsoft teams', has increased 600% in April compared to March 2020; also, online entertainment streaming, i.e. 'Shahid.net' increased 21% after March 2020 compared to 2019 (13). Increased screen time was associated with increased snacking and food intake (14) and the development of digital eye strain (DES) (15). DES is defined as one or more vision-related symptoms due to prolonged use of a computer, tablet, e-reader, or cell phone (16). Individuals who spend two or more continuous hours a day on digital screen devices are at risk of developing DES (16). Those above less favourable behaviours may individually or cumulatively act as risk factors for short and long-term consequences on mental and physical health. Hence, understanding the consequences of these risk factors on eating behaviour and their extended lifestyle effects is critical.

Contrary to those less favourable behaviours, a proportion of people found lockdown a suitable time to adapt to healthier behaviours. Home cooking was increased by more than 60% (3, 17); others lost weight (17) and engaged more in physical activity (3, 18).

This study sought to examine the changes in eating behaviour and lifestyle during lockdown due to the COVID-19 pandemic in Saudi Arabia. The primary objective was to retrospectively compare eating behaviour and lifestyle to that during the pre-lockdown period. The secondary objective was to evaluate the hours spent on digital devices and investigate symptoms associated with DES during the same period.

Materials and Methods

Setting

This study adopted an observational, cross-sectional design, conducted during the 24-h lockdown in April 2020. The study started on April 2nd, 2020, and ended on April 23rd, 2020. The inclusion criteria included residents of Saudi Arabia, aged >18 years old. Participants were approached via social media networks using a convenient sampling method. The questionnaire link was disseminated through WhatsApp and Twitter, as they represent the most widely used platforms in Saudi Arabia, accounting for 72% and 56% of internet users, respectively (19, 20).

Data collection

The data were collected using an anonymous self-administered online questionnaire. The questionnaire included 36 questions divided into 3 main sections: (1) demographic information, (2) eating behaviour, and (3) lifestyle. Demographic information was collected to describe the studied population (age, sex, nationality, education, marital status, region, and employment status). The eating behaviour section included questions on feelings of hunger and fullness, food preferences, and craving. The lifestyle section included questions about home cooking, physical activity, and digital device usage. To investigate the effects of digital device usage, 11 symptoms of DES were evaluated by requesting participants to compare ocular symptoms during the lockdown period to those before the lockdown (21-24). Finally, a set of exploratory questions were included on nutritional supplement use, observed weight changes, water consumption, home cooking, and sleeping patterns. Questions were structured to compare the current behaviour with that during the pre-lockdown period. Answers followed a 4-point Likert scale (was the provided behaviour practised more than before, less than before, same as before, or not applicable).

A total of 20 volunteers completed a pilot questionnaire to test the questionnaire's clarity and accuracy before final dissemination to the public. The estimated time required to complete the questionnaire was 10-12 minutes. Responses were saved and updated in real-time. The risk of missing data was minimal due to the questionnaire design and acceptance restricted to completed forms. The first page of the questionnaire included a standard consent form that was provided by King Saud University's institutional review board office. After reading a brief description of the study, interested participants had to accept their participation

Table 1. Population demographic information.

Characteristics		n	%
Age (years)[1]		36	(18)
Female		1396	75.1
Nationality	Saudi	1807	97.2
	Non-Saudi	53	2.8
Education	High school	303	16.3
	Graduate	1174	63.1
	Postgraduate	383	20.6
Job	Employed	1111	59.7
	Unemployed	749	40.3
Marital status	Single	568	30.5
	Married	1180	63.4
	Widowed	32	1.7
	Divorced	80	4.3
Isolation type	Home	1856	99.8
	MOH	4	0.2
Housing type	Apartment	301	16.2
	Flat	167	9.0
	House	1392	74.8
Outdoor space	Yes	1537	82.6
	No	323	17.4
Household members[1]		5	(3)
Region	Riyadh region	1142	61.4
	Eastern region	304	16.3
	Makkah region	166	8.9
	Other regions	248	13.4

[1]Median (IQR), MOH: Ministry of Health.

in the study before proceeding to the study questions. The study was approved by King Saud University's ethics committee (E-20-4794) and was conducted following the standards described in the 1964 Declaration of Helsinki.

Statistical analysis

Descriptive analysis was performed, and data were presented as frequencies and percentages (%) for categorical variables. The Shapiro-Wilk test was used to test for normality. Data followed a non-normal distribution; non-parametric tests were employed. Median and interquartile range (IQR) were used to present continuous variables. The perceived weight status (more than before vs same or less than before) was compared to the socio-demographic characteristics, eating behaviours, and lifestyle parameters by means of Chi-square test. Similarly, electronic device use (>6 hrs vs ≤6 hrs) was compared to different eye strain parameters. Multivariate regression analyses were conducted to determine the independent significant factor associated with the dependent binary variables where the adjusted odds ratio and 95% confidence interval were also being reported. A P-value ≤0.05 was considered statistically significant. Statistical analysis was performed using SPSS ver. 26.0 (IBM, Chicago, IL, USA).

Results

Demographic information

A total of 1,860 participants responded to the questionnaire. Approximately 75% of the participants were females, and 61% were from the Riyadh region (capital city). The complete breakdown of demographic characteristics is presented in (Table 1). When measuring the relationship between the demographic characteristics and the perceived weight status, age group in years ($p < 0.001$), outdoor space ($p = 0.028$), and job status ($p = 0.031$) had a significant relationship with the perceived weight status. None showed a significant effect on perceived weight gain (all $p > 0.05$) when conducting multivariate regression analysis.

Eating behaviours

For most eating behaviour parameters, approximately 50% of the participants reported maintaining their eating behaviour than that pre-lockdown. Consumption of sweet and savoury snacks, including chocolates, cookies, ice-cream, and chips, increased in 13–32% of the participants. A mild increase in cravings for sweet and savoury food was reported (36% and 26%, respectively). Of participants, 66% reported an increase in home cooking compared to

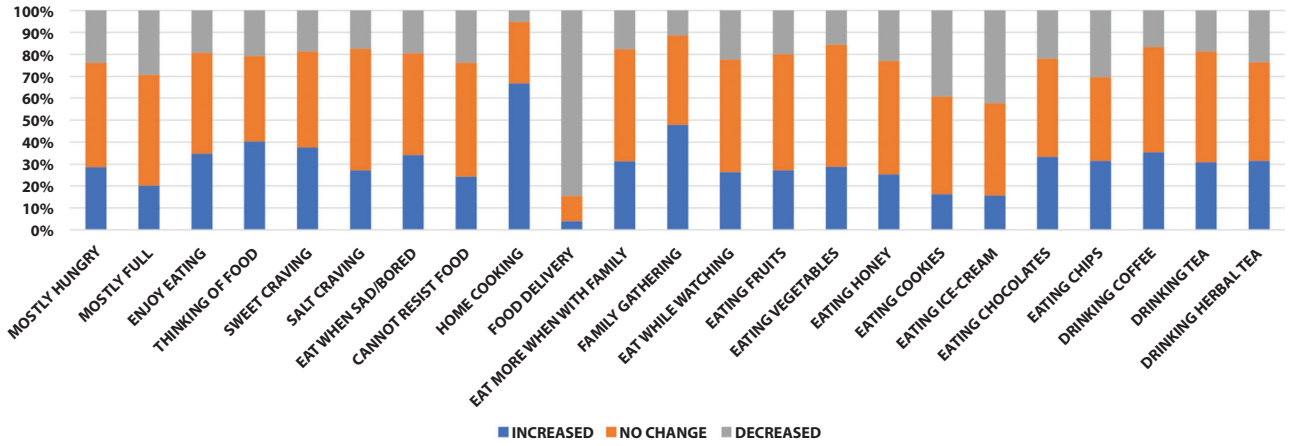

Figure 1. Eating behaviours compared to the pre-lockdown period.

Table 2. Multivariate logistic regression analysis to determine the influence of eating behaviours on weight status.

Eating Behaviours	Perceived Weight Status		AOR (95% CI)*	P-value
	Gain Weight	Same or Less		
Hungry most of the time				
Increased	299 (52.6%)	217 (17.6%)	Ref	
No change	195 (34.3%)	662 (53.8%)	0.527 (0.359 - 0.774)	**0.001**
Decreased	74 (13.0%)	352 (28.6%)	0.305 (0.181 - 0.513)	**<0.001**
Thinking of food most of the time				
Increased	345 (62.4%)	353 (30.0%)	Ref	
No change	147 (26.6%)	527 (44.7%)	0.738 (0.525 - 1.036)	0.079
Decreased	61 (11.0%)	298 (25.3%)	0.674 (0.406 - 1.118)	0.127
I eat when feeling sad or upset				
Increased	290 (53.7%)	262 (24.2%)	Ref	
No change	194 (35.9%)	562 (51.9%)	0.977 (0.693 - 1.378)	0.894
Decreased	56 (10.4%)	259 (23.9%)	0.914 (0.560 - 1.492)	0.719
I cannot resist food				
Increased	236 (45.0%)	140 (13.6%)	Ref	
No change	214 (40.8%)	593 (57.6%)	0.592 (0.410 - 0.854)	**0.005**
Decreased	74 (14.1%)	296 (28.8%)	0.440 (0.270 - 0.718)	**0.001**
Full most of the time				
Increased	94 (17.4%)	261 (21.3%)	Ref	
No change	179 (33.2%)	714 (58.2%)	0.595 (0.383 – 0.924)	**0.021**
Decreased	266 (49.4%)	252 (20.5%)	0.943 (0.586 - 1.518)	0.809
I enjoy food				
Increased	294 (51.5%)	345 (27.2%)	Ref	
No change	179 (31.3%)	670 (52.8%)	0.710 (0.515 - 0.978)	**0.036**
Decreased	98 (17.2%)	255 (20.0%)	0.879 (0.588 - 1.315)	0.531

Eating Behaviours	Perceived Weight Status		AOR (95% CI)*		P-value
	Gain Weight	Same or Less			
Sweet foods cravings					
Increased	310 (55.1%)	356 (29.4%)	Ref		
No change	183 (32.5%)	591 (48.9%)	0.790	(0.553 - 1.129)	0.196
Decreased	70 (12.4%)	262 (21.7%)	1.207	(0.726 - 2.007)	0.468
Salty foods cravings					
Increased	234 (41.8%)	244 (20.4%)	Ref		
No change	256 (45.7%)	717 (59.9%)	0.867	(0.615 - 1.223)	0.417
Decreased	70 (12.5%)	236 (19.7%)	0.884	(0.547 - 1.431)	0.617
Eat more due to family gathering					
Increased	263 49.3%	261 22.9%	Ref		
No change	203 38.1%	652 57.2%	0.678	(0.492 - 0.935)	**0.018**
Decreased	67 12.6%	227 19.9%	0.649	(0.417 - 1.008)	0.054
I eat while watching tv/mobile					
Increased	212 40.5%	220 19.6%	Ref		
No change	209 40.0%	636 56.7%	0.769 (0.543 - 1.090)		0.140
Decreased	102 19.5%	265 23.6%	0.969 (0.645 - 1.455)		0.878
Eating chocolates					
Increased	287 51.4%	304 25.0%	Ref		
No change	191 34.2%	603 49.5%	0.647 (0.461 - 0.908)		**0.012**
Decreased	80 14.3%	311 25.5%	0.543 (0.353 - 0.834)		**0.005**

*The predicted probability is of 'gain weight'. AOR: Adjusted odds ratio.

that pre-lockdown. These findings coincided with a 74% decrease in ordering food deliveries due to fear of infection by COVID-19 through contact with food products or handling. Complete data are presented in Fig1.

Table 2 presents the multivariate logistic regression model results assessing the association between perceived weight loss and eating behaviours.

Lifestyle parameters

Weight gain during the lockdown was reported by 31%, while 15% reported weight loss. Of the population, 20% followed a weight reduction regimen. Physical activity increased by 21%, while 51% maintained their physical activity. Complete data are presented in (Table 3).

Table 4 presents the multivariate logistic regression model results assessing the association between perceived weight loss and lifestyle parameters.

Digital device usage and DES-associated symptoms

An increase in the hours spent on digital devices was reported among 70%, while 26% reported decreased hours spent on digital devices than the pre-lockdown period. The median number of hours spent on digital devices during the lockdown period was 7 hours and ranged from 1 to 20 hours daily. All participants reported that they used their smartphones daily, of which 70% reported that they used more than two devices a day.

The incidence of DES was found to be 59%, with participants reporting one or more DES-related

Table 3. Lifestyle parameters.

		n	%
Why Stopped food delivery?	Fear of corona	1384	74.4
	Time restriction	360	19.4
	Did not change	116	6.2
Weight status	Gain weight	578	31.1
	Same	1000	53.8
	Lost weight	282	15.2
Following any diet?	yes	369	19.8
	No	1491	80.2
Water consumption	< 1 Litre	536	28.8
	1-1.5 Litre	735	39.5
	1.6 - 2 Litre	384	20.6
	> 2 Litre	205	11.1
Do you do any exercise?	Yes	956	51.4
	No	904	48.6
Supplement use	Yes	493	26.5
	No	1367	73.5
Reason for supplement	Regularly	427	86.6
	During COVID-19	66	13.4

symptoms. The most-reported increased symptoms were headaches (40%), followed by eye strain (31%). The percentages of all reported DES symptoms are shown in (Table 5).

Chi-squared tests were conducted to assess the association between the number of hours spent on digital devices per day and symptoms complaints. Participants who used digital devices >6 hours per day were at a higher risk of developing DES symptoms (Table 6).

Discussion

This cross-sectional study evaluated Saudi Arabia residents' eating behaviours and lifestyles during complete lockdown due to the COVID-19 pandemic. This study's findings demonstrated a rapid change in individuals' behaviours when the Saudi government imposed home confinement. The most pronounced changes were observed in hedonic eating, home cooking, and the use of digital devices.

One-third of the study population reported weight gain. Our results are comparable to other surveys conducted during the lockdown among different populations, with weight gain ranging from 19 – 30% (17, 25, 26). A higher proportion of the population (49%) reported weight gain in an Italian study (8). Among patients with obesity, weight maintenance was even more challenging, with 70% reporting difficulties in maintaining weight goals during lockdown (3). We did not conduct a separate analysis based on BMI due to the subjective nature of the self-reported online survey, especially when reporting weight and height, usually subject to under-reporting (27, 28). Several factors may explain this increase in weight, including increased eating due to stress and boredom, increased consumption of sugary drinks, and increased snacking (3, 9, 17, 25, 26).Almost one-third of our study population reported an increase in eating when stressed, bored, or eating with family. Our data showed that participants who gained weight were more likely to adopt unhealthy behaviours like not exercising, eating more chocolates, not following a diet, and drinking less than one litre of water daily than those who maintained or lost some weight. Previous studies have also reported weight gain during lockdown among people with decreased physical activity (29), unhealthy eating behaviours, including snacks and sweets (8). An accelerated effect on weight was observed among people with obesity within a month of lockdown, where weight gain was associated with lower exercise and intake of snacks and sweets (30).

In contrast, a small proportion of our study population reported weight loss. In line with our results, data from a cross-sectional study in Poland reported weight loss in 18% of the study population (17). Conscious food restriction to control weight gain (18) and dieting may have promoted weight loss in this group.

A smaller proportion of our study population reported an increase in physical activity. This increase was comparable to that in other studies, which have reported a 17 – 35% increase in exercise (3, 18). We speculate that this increase in physical activity could be

Table 4. Multivariate logistic regression analysis to determine the influence of lifestyle parameters on weight

Lifestyle Behaviours	Perceived Weight Status		AOR (95% CI)*	P-value
	Gain Weight	Same or less		
Sleeping hours				
Increased	276 (38.5%)	441 (61.5%)	Ref	
No change	198 (24.0%)	198 (24.0%)	0.586 (0.454 – 0.757)	**<0.001**
Decreased	97 (32.1%)	97 (32.1%)	0.728 (0.527 – 1.005)	0.054
Sleeping quality				
Increased	122 (38.7%)	193 (61.3%)	Ref	
No change	152 (21.8%)	546 (78.2%)	0.510 (0.371 – 0.703)	**<0.001**
Decreased	250 (37.1%)	423 (62.9%)	0.922 (0.681 – 1.248)	0.600
Following a weight loss diet				
No	511 (34.3%)	980 (65.7%)	Ref	
Yes	67 (18.2%)	302 (81.8%)	0.522 (0.378 – 0.722)	**<0.001**
Water consumption per day				
>2 L	41 (20.0%)	164 (80.0%)	Ref	
1.6 – 2 L	103 (26.8%)	281 (73.2%)	1.271 (0.819 – 1.972)	0.284
1 – 1.5 L	218 (29.7%)	517 (70.3%)	1.429 (0.956 – 2.137)	0.082
<1 L	216 (40.3%)	320 (59.7%)	1.994 (1.316 – 3.022)	**0.001**
Regular exercise				
No	351 (38.8%)	553 (61.2%)	Ref	
Yes	227 (23.7%)	729 (76.3%)	0.595 (0.472 – 0.749)	**<0.001**

*The predicted probability is of 'gain weight'. AOR: Adjusted odds ratio.

Table 5. Self-reported DES-associated symptoms[1].

Symptoms	Increased %	No change %	Decreased %
Headache	40	43	9
Eyestrain	31	42	7
Dryness	27	46	7
Itchiness	23	47	7
Burning sensation	18	45	8
Blurry vision	17	47	7
Sensitivity to bright light	17	48	8
Heavy lids	16	49	6
Redness	13	48	9
Tears	12	55	11
Double vision	9	48	8

[1]Results of 'not applicable' are not shown.

due to outdoor space availability within homes where physical activity can be performed in-home, primarily with the pleasant weather during April in Saudi Arabia. In this regard, the Saudi Ministry of Sports launched the "Your home, Your gym" campaign in March 2020 to encourage people to stay fit and active during lockdown using different social media platforms (31).

Remote work and minimal or no access to gyms were expected to result in a dramatic decrease in physical activity during the lockdown. Our population reported a 40% decrease in physical activity. Similarly, international figures indicate a 42 – 48% decrease in physical activity during lockdown (3, 9, 18, 25). Parallel to this decrease in physical activity, an increase in sedentary behaviour was expected.

We found that protective factors against weight gain were decreased hunger, increased resistance to

Table 6. The association between the number of hours spent on digital devices per day and the complaints of symptoms.

Symptoms	More	Same or less	OR (95% CI)	P-value
Tearing				
≤ 6 hours	84 (38.7%)	576 (47.5%)	0.697 (0.519 - 0.937)	**0.016**
> **6 hours**	133 (61.3%)	636 (52.5%)		
Itching				
≤ 6 hours	167 (39.1%)	484 (48.1%)	0.693 (0.550 - 0.872)	**0.002**
> **6 hours**	260 (60.9%)	522 (51.9%)		
Heavy lids				
≤ 6 hours	101 (34.6%)	498 (48.4%)	0.564 (0.430 - 0.739)	**<0.001**
> **6 hours**	191 (65.4%)	531 (51.6%)		
Dryness				
≤ 6 hours	185 (37.6%)	483 (49.6%)	0.611 (0.490 - 0.763)	**<0.001**
> **6 hours**	307 (62.4%)	490 (50.4%)		
Redness				
≤ 6 hours	92 (37.4%)	508 (48.1%)	0.646 (0.485 - 0.859)	**0.003**
> **6 hours**	154 (62.6%)	549 (51.9%)		
Blurry vision				
≤ 6 hours	122 (39.5%)	479 (47.8%)	0.714 (0.551 - 0.925)	**0.011**
> **6 hours**	187 (60.5%)	524 (52.2%)		
Double vision				
≤ 6 hours	62 (37.8%)	491 (47.1%)	0.683 (0.487 - 0.958)	**0.027**
> **6 hours**	102 (62.2%)	552 (52.9%)		
Burning sensation				
≤ 6 hours	124 (38.0%)	482 (48.8%)	0.643 (0.498 - 0.831)	**0.001**
> **6 hours**	202 (62.0%)	505 (51.2%)		
Eyestrain				
≤ 6 hours	205 (35.3%)	452 (50.8%)	0.528 (0.426 - 0.655)	**<0.001**
> **6 hours**	376 (64.7%)	438 (49.2%)		
Headache				
≤ 6 hours	218 (37.9%)	467 (48.1%)	0.659 (0.534 - 0.813)	**<0.001**
> **6 hours**	357 (62.1%)	504 (51.9%)		
Sensitivity to bright light				
≤ 6 hours	118 (37.0%)	494 (47.7%)	0.643 (0.497 - 0.832)	**0.001**
> **6 hours**	201 (63.0%)	541 (52.3%)		

food, decreased chocolate intake, maintenance of sleep hours and quality, following weight loss diet, and maintenance of regular exercise. The single risk factor for weight gain was drinking less than one liter of water per day. Our study found that protective factors against weight gain were decreased hunger, increased resistance to food, decreased chocolate intake, maintenance of sleep hours and quality, following weight loss diet, and maintenance of regular exercise. In line with our findings, results from Chili, a cross-sectional study

during lockdown reported an increased risk of weight gain with increased consumption of chocolates and chocolate-based products (32). Bacaro et al.'s meta-analysis showed short sleep duration is linked to an increased risk of obesity (33). Similarly, a prospective study of the Saudi population during lockdown found physical activity to be protective against weight gain (34). The single risk factor for weight gain was drinking less than one liter of water per day. Two epidemiological studies found an inverse relationship between drinking water and weight status (35, 36).

As a result of the lockdown, people were forced to stay home, and an increase in the vocational and non-vocational use of digital devices was anticipated. The present study results demonstrated that 70% of participants reported an increase in screen time relative to that pre-lockdown. The number of hours reported by participants was 7 hours, which is higher than previously reported (5 hours per day) (37). A recent study conducted in Saudi Arabia during the lockdown period demonstrated that Saudis spend 10 hours on digital devices daily (38). However, this study required participants to report their digital device usage hours using the phone's screen time log compared to their personal estimates, explaining the differences in the results. Pietrobelli et al. revealed a 5-hour daily increase in screen time for children during the lockdown in Italy for non-school activities (9). The majority of participants reported using two or more devices daily, which has been shown to contribute to an increase in DES-related symptoms (39).

The development of DES-related symptoms is associated with the prolonged use of digital devices (40-42). The most commonly reported symptoms were eye strain, headache, and dryness. Previous studies have reported eye strain as the most frequent symptom associated with DES (38, 42-44). Similarly, headache and dryness are commonly reported symptoms (38, 45-47). Dryness has been a significant contributor to DES (46, 48) and maybe more prevalent in countries with a hot and dry climate (49, 50). The increase in screen time usage due to the lockdown significantly increased the risk of developing DES-related symptoms (table 6) and was linked to sedentary time—excessive screen time as sedentary behaviour increases the risk of obesity (51, 52). Indeed, obesity risk is increased by two-fold in individuals with a screen time of ≥ 8 hours per day (52, 53). Banks reported that individuals who are unemployed and spend prolonged time on their devices are at a higher risk of obesity when compared to employed individuals. Digital devices are vital tools for work, as people rely on them for regular work tasks. However, during the lockdown, tasks that previously did not require the use of digital devices, such as face-to-face meetings, were transformed into virtual meetings that necessitated the use of digital devices. Given the lockdown's unprecedented nature, it is unclear if previous results are generalizable to the context of the COVID-19 pandemic. Lockdown restrictions and curfew enforcement increased the total amount of time people spent at home to practice social distancing. These circumstances may result in different conclusions.

Several studies have recommended the 20-20-20 rule to manage DES (24, 54, 55). The 20-20-20 is defined as taking a break every 20 minutes for 20 seconds by looking at an object at 20 feet. The present study results revealed that only 26% of participants were aware of the 20-20-20 rule; of this subgroup, only 37% practised this rule. These findings are similar to other studies that showed poor awareness of the importance of practising the 20-20-20 rule to reduce DES symptoms (38, 40). Health awareness campaigns should raise awareness of the effects of excessive screen time, including regular eye exams, limiting screen time, and promoting the practice of the 20-20-20 rule.

We evaluated how increased panic and anxiety regarding infection and transmission methods affected the behaviour of food delivery. Of participants, 72% stopped food delivery, predominantly due to fear of contracting infections from direct contact with food delivery through drivers or food package surfaces. In contrast, most of the surveyed population reported increased home-cooking. These figures were replicated in other studies reporting an increase of 62 – 64% in home-cooking (3, 8, 17). Although increased home-cooking may be considered positive behaviour, it is accompanied by increased food-stocking. The fear of supply shortage resulted in an overall increased purchase of food items (56). Moreover, poor choices of ultra-processed foods due to their long shelf-life complicated the situation. The availability of highly

palatable energy-dense foods in households was detrimental to food intake control in overweight or obese individuals (57).

With the heightened anxiety and fear of viral spread, social media platforms transformed into misleading educational platforms (58). Users share herbal remedies and suggest nutritional supplements claiming to boost immunity despite the lack of scientific evidence. Nevertheless, the number of nutritional supplement users was less than expected, with fewer participants who began consuming supplements to boost their immunity.

The lockdown may have collateral effects on weight management, eating behaviour, screen time, and DES-related symptoms. Recognizing the effects of lockdown is the first step to implement preventive measures to maintain a healthy lifestyle.

Limitations

Although this study provides insight into how the pandemic-related lockdown affected eating behaviour and lifestyle, several limitations need to be addressed. First, there may have been a risk of selection bias due to the study's cross-sectional nature. Second, the risk of misreporting, especially by older participants, was present given that the questionnaire was self-administered. Third, participants who do not use social media could not be reached. However, this study was conducted during the lockdown period, when physical access to people was not possible. Finally, there was a limited time for data collection (20 days) due to the beginning of the holy month of Ramadan, during which changes in eating behaviour and physical activity are expected due to prolonged hours of fasting. Nevertheless, these limitations were unavoidable, considering the governmental policies to contain the spread of the pandemic.

A strength of our study was that it was conducted during the most critical period of the lockdown in Saudi Arabia, which involved a complete lockdown whereby maximum precautions were implemented. Other studies should assess similar behaviours during partial lockdown when public restrictions are loosened. Using an online tool during this critical period is recommended to guarantee all participants and researchers' safety.

Conclusions

To conclude, this study's findings shed light on the impact of the lockdown on eating behaviour and lifestyle during the initial lockdown phase. The effects of the COVID-19 pandemic extend beyond viral infection to affect normal lifestyle and eating behaviour. Indeed, the infection control guidelines were set to reduce this novel disease's spread and mortality rate. However, a negative impact on eating behaviour and lifestyle is inevitable—the increase in unhealthy eating behaviours strongly associated with adverse health consequences. Despite the reported unhealthy changes in eating behaviours and lifestyle, several positive behaviours were adopted by a subset of participants during the lockdown, including increased home-cooking, reduced fast-food delivery, weight loss, and increased physical activity. The challenge lies in the ability to maintain these positive behaviours over the longer term. Providing people with strategies and tailored interventions to overcome adverse eating behaviour changes and sedentary lifestyles during this critical phase is vital.

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