Journal of Umm Al-Qura University for Medical Sciences

Journal homepage: https://uqu.edu.sa/en/mj

Research Article

Effects of Home Confinement on Sleep Quality, Weight Change and Eating Habits during COVID-19 Outbreak among Adults

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ARTICLE INFO

Received: 21/12/2022
Revised: 29/01/2023
Accepted: 26/02/2023

Keywords:
Saudi Arabia; Sleep; COVID-19; Cross-sectional, Eating.

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ABSTRACT

Background: Many countries have implemented governmental social distancing measures and home confinement during the coronavirus disease 2019 (COVID-19) pandemic, causing significant changes to people's daily routines. Aim of the study:1) compare sleep quality and eating habits before and during confinement, 2) report the prevalence of poor sleep quality and weight change, and 3) study the association between sleep quality and eating habits.

Methods: This cross-sectional study used an online questionnaire from April 2020 to July 2020. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Participants were asked about weight change during confinement, the number of meals, and eating habits.

Results: 368 participants (281 women, 87 men) from Saudi Arabia were included. COVID-19-related home confinement led to an increase in global PSQI scores ($P < 0.001$). The prevalence of poor sleep quality was 70% and 33% for increased weight during confinement. This negatively affected eating habits, except for eating out, which significantly decreased during detention ($P < 0.001$). A significant association was observed between one and three main meals and sleep quality during confinement; poorer sleep quality was associated with fewer main meals.

Conclusion: COVID-19 home confinement has negatively hurt sleep quality, weight, and eating habits, which are significant determinants of health. Therefore, increased awareness of these factors during this period is essential.

1. INTRODUCTION

Sleep is essential for many vital functions, including brain waste clearance, modulation of immune responses, and brain development (R. Zielinski et al., 2016). According to the Sleep Organization, two domains are typically used to describe sleep: quantity, and quality (Sleep Organization, 2020). Sleep quality integrates many aspects, including sleep initiation, maintenance and amount. In addition, sleep quality has been defined as the feeling of an individual being refreshed upon waking and satisfied (Gellman & Turner, 2013). Several studies have suggested a bidirectional relationship between sleep and immunity against bacterial, parasitic, and viral infections (Irwin & Opp, 2017). Hence, identifying factors associated with poor sleep quality during the pandemic is a public health priority that may be crucial for developing and progressing coronavirus disease 2019 (COVID-19)(H. Kim et al., 2021).

In response to the World Health Organization's (WHO) declaration of a pandemic and strategic preparedness and response plan, (WHO, 2020a) many countries initiated lockdown restrictions, social distancing, and working from home. The Kingdom of Saudi Arabia (KSA) has applied many conditions, including virtual classrooms for all education sectors, since March 9th, 2020,(Arab news, 2020) a curfew, mandatory home confinement, and suspension of the Umrah pilgrimage. The efforts of the Kingdom of Saudi Arabia to prevent and control the spread of COVID-19 were acknowledged by the World Health Organization. Which positively commented on

Doi: https://doi.org/10.54940/ms47435205

the preventive measures, preparedness, detection and isolation conducted by Saudi Arabia (WHO, 2020b). After several months of home confinement, people continued to work and study from home and may have experienced significant changes in their daily routines, as previously reported in China (Zhang et al., 2020). Therefore, studies assessing the effects of home confinement and its duration on sleep quality are crucial to understanding the resulting changes.

Home confinement due to the COVID-19 pandemic may negatively affect several factors influencing sleep quality. A recent study found that the COVID-19 lockdown is associated with changes in the duration, quality of nighttime sleep and sleep schedule. In addition, higher anxiety and depressive symptoms were observed during home confinement compared to the pre-lockdown period(Gupta et al., 2020). Sleep problems, home confinement, and prolonged stay at home may negatively affect eating habits, as people tend to overeat or restrict food intake (Husain & Ashkanani, 2020). Consequently, these factors may cause weight changes in individuals during confinement. A recent review showed that the COVID-19 quarantine induced alterations in sleep, eating behaviors, and body weight (da Silva et al., 2020). However, the effects of home confinement on sleep quality, weight changes, and eating habits in the Saudi population are limited.

The measures applied during home confinement may disrupt people's lives and have important implications for their health and well-being (Lima et al., 2020). Evidence on the association between sleep quality and eating habits during home confinement is lacking. Therefore, exploring the potential influence of sleep quality on eating habits and the changes in sleep quality and eating habits during home confinement is critical to establish basic information for developing appropriate recommendations for lifestyle modifications during this time. Therefore, this study aimed to: 1) compare sleep quality and changes in eating habits during and before the home confinement period; 2) assess the proportion of subjects with poor sleep quality during home confinement; 3) assess the prevalence of weight changes during home confinement; and 4) explore the associations between sleep quality and eating habits (focusing on questions regarding the number of main meals and snacks) during and before home confinement.

2. MATERIALS AND METHODS

2.1 Study design

Web-based cross-sectional survey conducted using the Google platform. Participants were informed on the study are survey's first page that their information is confidential and only the researchers have access to the data. Participants were required to provide consent to participate and were informed that their participation would be anonymous. The two researchers independently translated the survey (the sleep and physical activity questionnaires were previously translated and validated) from English to Arabic. Before use in this study, the questionnaire was initially administered to 10 bilingual subjects who completed both the Arabic version and the English version to determine the test–retest reliability. Sleep quality, physical activity, stress and eating habits were independent of the performance.

2.2 Study participants

Participants aged ≥18 years who were under home restriction were included. Participants who were not under home restriction were excluded (Table 1), as were pregnant and lactating women, owing to poor sleep quality and changes in eating habits (Sedov et al., 2018).

The developed online questionnaire assessed changes in sleep quality, stress, physical activity level, and eating habits during confinement. It was distributed online via a range of methods, such as Email invitations, LinkedIn ®, Twitter®, Instagram®, WhatsApp® and other social media platforms from April 2020 to July 2020. The questionnaires were administered in English and Arabic and included questions on demographic information, home confinement, health, sleep quality, stress, physical activity level, and eating habits. All questions were presented in a particular format, so that questions were answered directly in sequence regarding "before" and "during" confinement conditions. The study was approved by the Directorate of Health Affairs, Research, and Studies Department in Taif (IRB registration number: HAP-02-T-067) and conducted according to the principles of the Helsinki Declaration.

2.3 Survey questionnaires

The electronic survey assessed changes in multiple lifestyle behaviours during the COVID-19 pandemic. Therefore, the survey included a collection of brief questions from validated questionnaires. The questionnaires assessed sleep quality (Pittsburgh Sleep Quality Index [PSQI])(Buysse et al., 1989), physical activity level (short form of the International Physical Activity Questionnaire),(CRAIG et al., 2003), and stress (Calgary Symptoms of Stress Inventory) (Carlson & Thomas, 2007). However, this study only evaluated sleep and eating habit questionnaires to assess these changes during the COVID-19 outbreak.

At the beginning of the questionnaire, there was an introductory page describing the background and the aims of the survey, information about how their answers will be handled, contact information of the researchers, ethics information for participants, and the option to choose one of the two available languages.

2.3.1 Demographic questions

Participants were asked about their location (rural or urban), nationality, age, and gender. Women were asked about their pregnancy and breastfeeding status. In addition, the survey included questions on home confinement (for example, whether they were under home restriction), education, employment, marital status, smoking status, living with and having children, and health status.

2.3.2 Sleep Quality Questionnaire

Sleep quality was assessed using PSQI, an 18-item

questionnaire. Two versions of the PSQI were used: English (Buysse et al., 1989) and Arabic (Suleiman et al., 2010). The Arabic version of the PSQI has been validated and used in previous studies (Suleiman et al., 2010). The PSQI is a subjective measure that assesses seven factors of sleep: subjective sleep quality, sleep latency**,** sleep duration, habitual sleep efficiency, sleep disturbances, sleep medication use, and daytime dysfunction. Each dimension was scored between 0 and 3, with the total score ranging from 0-21. Based on the total PSQI score, participants were classified into good sleep quality (PSQI score ≤ 5) and poor sleep quality (PSQI score > 5) groups (Buysse et al., 1989) to define and compare the proportions (%) of participants before and during home confinement.

2.3.3 Eating habits.

The participants were asked about the usual number of meals and snacks consumed before and during confinement. In addition, they were asked about the frequency of eating at restaurants, take-away or delivered food, and having meals at the same time of day before and during confinement. The responses of eating habits were integrated and divided into two categories for the consumption frequency of main meals (category 1: 0-3 meals/day; category 2: > 4 meals/day) and snacks (category 1: 0-2 snacks/day; category 2: > 2 snacks/day) for more straightforward interpretation of the results. A question was asked regarding weight changes compared with before confinement.

2.4 Statistical analysis

Descriptive analyses were conducted to define the proportion of responses to each question and the total distribution in the PSQI and eating habits questionnaires. Values are reported as the mean ± SD for continuous variables or percentages for categorical variables. The normality of data distribution was confirmed using the Shapiro-Wilk W-test. Sleep quality scores were compared before and during COVID-19 for skewed distribution data using the Wilcoxon signed rank test and the paired sample t-test for normally distributed data.

Due to skewed distribution data for some of the eating habits questions, the Wilcoxon signed-rank test was used to compare the eating habit questions before and during the home confinement period. To assess the associations between sleep quality and eating habits (focusing on questions regarding the number of main meals and snacks owing to the scarcity of research in this field during the COVID-19 period), a cross-table chi-square (X^2) analysis was conducted. The phi coefficient was used to detect the strength of associations, which was interpreted as follows: strong (> 0.15), moderate (> 0.10), weak (> 0.05), and very weak (> 0) (Akoglu, 2018). Statistical significance was set at $p < 0.05$. All statistical analyses were performed using SPSS version 20 (IBM Corp., Armonk, NY, USA) and Microsoft Excel 2010 (Microsoft Corp., Redmond, WA, USA).

3. RESULTS

3.1 Sample description

In total, 454 participants completed the survey. From these responses, 86 participants were excluded, including pregnant and lactating women (n = 36), participants aged <18 years (n = 6), and participants who were not under home confinement restrictions (n = 44). This exclusion resulted in the selection of 368 participants for the final analysis. The respondents' characteristics are presented in Table 1. Overall, the majority of participants (76%, n = 281) were women. Geographical breakdown showed that most participants were from Saudi Arabia (79%, n= 292), whereas 21% (n = 76) were from other countries. The most participants were from Makkah (33%, n = 123).

Table 1. Demographic characteristics of the participants (N = 368).

Variables		Number	Percent (%)
Sex	Male	87	24
	Female	281	76
Age (years)	18–35 years old	247	67
	36–55 years old	115	31
	>55 years old	6	2
Marital status	Single	161	44
	Married	193	52
	Widowed/Divorced/Separated	14	4
Education level	Primary or intermediate school	6	2
	High school graduate, diploma or the equivalent	27	7
	Bachelor's degree	235	64
	Master/doctorate	98	27
	Professional Degree	1	0.3
	Non-educated	1	0.3
Employment status	Unemployed	52	14
	Student	100	27
	Governmental employee	104	28
	Private sector employee	59	16
	Self-employed	17	5
	Problem/unemployment caused by COVID-19	19	5
	Retired	3	1
	Other	12	3
	Unable to work	2	0.5
Country (Currently living)	Saudi Arabia	292	79
	Others	76	21
City (Currently living)	Makkah	123	33
	Al-Khobar	4	1
	Al-Dammam	6	2
	Al-Ahsa	5	1
	Al-Qassim	1	0.3
	Hail	2	0.5
	Al-Qatif	2	0.5
	Abha	2	0.5
	Buraydah	6	1.6
	Al-Kharj	2	0.5

	Jeddah	69	19
	Al-Baha	1	0.3
	Al-Lith	1	0.3
	Al-Qunfudhah	1	0.3
	Arar	1	0.3
	Khamis Mushait	1	0.3
	Eastern Region	3	1
	Al-Taif	6	2
	Al-Medina	8	2
	Yanbu	1	0.3
	Al-Riyadh	38	10
	Jizan	6	2
	Al-Dhahran	2	0.5
	Tabuk	1	0.3
	Outside Saudi Arabia	76	21
Excluded participants	Age < 18 years old	6	
	Pregnant and lactating women	36	
	Not under home confinement restrictions	44	

3.2 Sleep quality before and during home confinement.

The comparison of the PSQI questionnaire responses of 368 participants before and during home confinement is presented in Table 2. When analysing the subjective data about sleep and comparing it to that before home confinement, a significant increase in all sleep parameters ($p < 0.05$) during home confinement were observed, except for the sleep medication use score, and there were no differences before and during home confinement. A Wilcoxon signed-rank test indicated an increase in sleep latency (minutes/day) during home confinement ($p < 0.001$). Moreover, there was an increase in sleep duration (hours/day) during home confinement (7.03 ± 1.650 vs. 7.36 ± 2.210; $p = 0.006$). In addition, during home confinement, the mean total PSQI score increased by more than one point compared with that before home confinement ($p < 0.001$).

Table 2. Subjective sleep quality before and during home confinement (N=368).

Sleep variables	Means ± SD[1]		p-value
	Before confinement	During confinement	
§Subjective sleep quality	0.90 ± 0.950	1.59 ± 1.025	< 0.001**
§Use sleep medication	0.28 ± 0.696	0.27 ± 0.728	0.985
§Sleep latency(minutes)	24.54 ± 22.129	32.80 ± 33.104	< 0.001**
§Sleep efficiency	0.50 ± 0.913	0.75 ± 1.153	< 0.001**
*Sleep duration(hours/day)	7.03 ± 1.650	7.36± 2.210	0.006**
*Sleep disturbance	1.16 ± 0.503	1.39 ± 0.617	< 0.001**
*Daytime dysfunction	1.01 ± 0.845	1.13± 0.911	0.006**
*Total PSQI[2] score	6.31 ± 3.560	7.58± 3.527	< 0.001**

[1] SD: Standard Deviation; [2] PSQI: Pittsburgh sleep quality index.
§The Wilcoxon Signed-Rank tests were used.
* Paired sample T-tests was used.
** Statistical significance was accepted as $p < 0.05$

3.2.1 Frequency of individuals experiencing excellent and poor sleep before and during confinement

The proportions of surveyed individuals experiencing excellent and poor sleep before and during home confinement are shown in Figure 1.

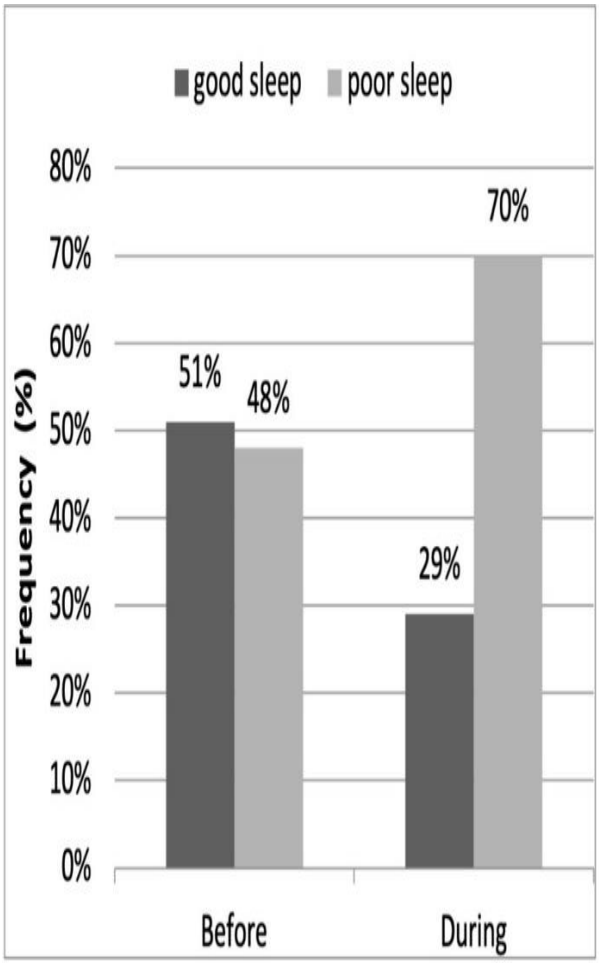

Figure 1. Frequency (%) of individuals experiencing good (PSQI Score ≤5) and poor sleep (PSQI Score >5) before and during home confinement.

3.3 Eating habits of participants before and during home confinement

The participants' eating habits before and during home confinement are shown in Figure 2. Further analyses using the Wilcoxon signed-rank test were conducted to determine whether the differences in eating habits were significant. A significant difference was found for all four questions on eating behaviour when comparing before and during home confinement, including an increased number of main meals per day ($P = 0.019$), increased number of snacks/day ($P = 0.024$), disruption of regular eating at the same time ($P < 0.001$), and reduction in regular eating-out (take away and restaurants) during confinement ($P < 0.001$).

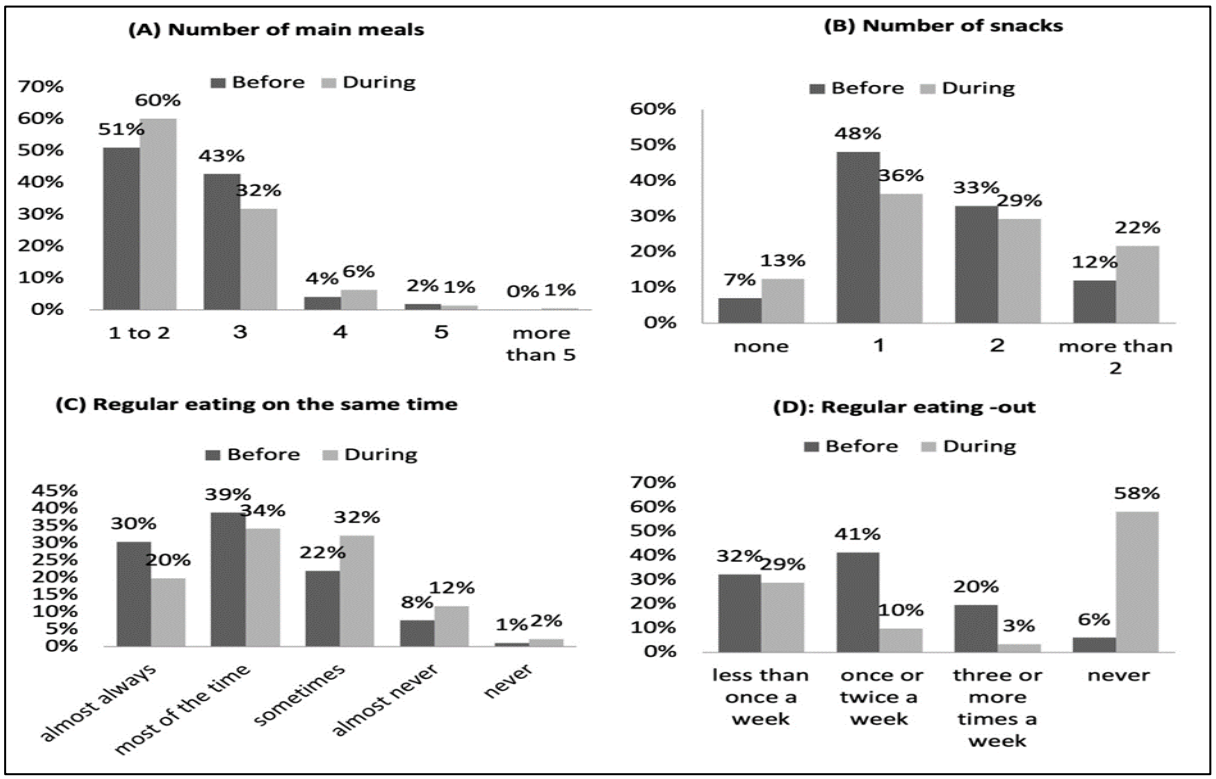

Figure 2. Comparison of eating habits of participants before and during home confinement (A) Number of main meals; (B)Number of snacks; (C) Regular eating at the same time; and (D) Regular eating-out (shown in percentages

3.4 Weight change during home confinement

Figure 3. represents the self-reported weight change during home confinement, showing that 33% of the participants reported an increase in weight, 28% reported a decrease in weight, 28% said the same weight, and 10% did not know.

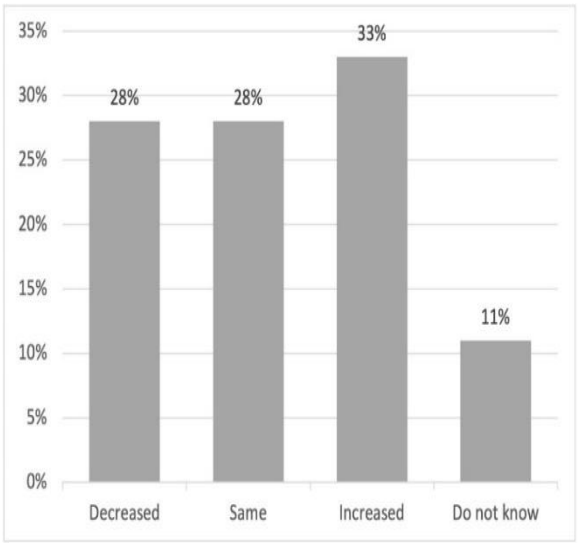

Figure 3. Weight changes during home confinement compared to before home confinement.

3.5 Association between sleep Quality and eating habits before and during Home Confinement

The association between sleep quality and eating habits (number of main meals and snacks) before and during home confinement for the 368 participants is presented in Table 3. There were no associations between any categories except for sleep quality and number of main meals during detention ($\chi 2[1] = 4.04$, P = 0.044, phi = 0.044), and 63% (n = 234) of participants who experienced poor sleep during home confinement indicated that they consumed one to 3 main meals per day.

Table 3. The association between sleep quality and eating habits (Number of main meals and snacks) before and during home confinement (N = 368).

Diet variables		**Before confinement N (%)**			**p-value**	**During confinement N (%)**			**p-value**
		Good sleep *	**Poor sleep ****	**total**		**Good sleep[3]**	**Poor Sleep[4]**	**total**	
Number of main meals	1 to 3	175 (47%)	171 (46%)	346 (94%)	0.235	104 (28%)	234 (63%)	338 (92%)	0.044***
	More than 4	14 (3%)	8 (2%)	22 (6%)		4 (1%)	26 (7%)	30 (8%)	
Number of snacks	0 to 2	166 (45%)	158 (43%)	324 (55%)	0.897	89 (24%)	199 (54%)	288 (49%)	0.214
	More than 2	23 (6%)	21 (5%)	44 (45%)		19 (5%)	61 (16%)	80 (51%)	

4.DISCUSSION

This study presents data from an online survey collected in 2 languages to assess changes in sleep quality and eating habits related to home confinement during the COVID-19 confinement pandemic confinement pandemic. The present study reports result from 368 participants, who were mainly from Saudi Arabia (79.3%) and the majority of them women (76.4%). The results showed that (1) COVID-19 home confinement had an increasing effect on all PSQI parameter scores (poorer sleep quality) during confinement, except for medication use. (2) The negative effect of COVID-19 home confinement on many dietary habits, including an increase in the number of main meals and snacks and disruption of regular eating at the same time. In contrast, regular eating from outside (takeaway and restaurants) significantly decreased during home confinement;(3) 33% of participants reported an increase in weight during home confinement (4). The proportion of individuals who experienced poor sleep quality increased during home confinement (48% vs. 70%) (5). A significant association was found between good and poor sleep quality and the number of main meals during confinement, and, inferior sleep quality was associated with fewer main meals.

4.1 Sleep during Confinement

Good sleep habits and a healthy balanced diet are recommended during this challenging period to boost the immune system (Aman & Masood, 2020). One of the significant findings of our study was the increase in global PSQI scores (higher scores indicate poorer sleep quality) (Buysse et al., 1989) during home confinement despite longer sleep duration. Moreover, there was an increase in the percentage of individuals experiencing poor sleep quality during home confinement compared with that before detention. These findings were broadly consistent with our hypotheses and previous studies conducted during the COVID-19 pandemic in 5056 participants who reported worsening sleep quality, increased global PSQI scores, and decreased frequency of individuals experiencing good sleep quality during home confinement (Trabelsi et al., 2021). Similarly, a recent study conducted in the United States during COVID-19 pandemic found that high majority of poor sleep quality among both males and females are predisposed to insomnia, anxiety, depression, and coping strategies (Alqahtani et al., 2022).

Sleep patterns may have resulted from multiple modifications caused by the COVID-19 pandemic, such as new stressors caused by new situations, uncertainties about health, and increased parenting responsibilities, especially for women (who represented the majority of our participants), which had an inverse relationship with sleep. The national mental health survey reported that higher levels of depression and anxiety among Saudi females (Al-Subaie et al., 2020), which will more likely affect their sleep pattern, have poor sleep quality and sleep disturbances (Alodhayani et al., 2023; Casagrande et al., 2020). The second reason for changes in sleep may be decreased use of sleep medications, as observed in our study. The primary purpose of sleep medications is to improve sleep (Sasai et al., 2010); however, the reduced use may be related to lockdown restrictions, which will consequently affect their sleep quality.

This study found that sleep latency increased significantly during home confinement. A recent study has shown similar results with a significant increase in sleep latency among Saudis in Riyadh (Alodhayani et al., 2023). This finding may result from increased anxious thoughts about the pandemic before falling asleep and prolonged screen time use during confinement. Studies have shown a negative association between smartphone exposure close to bedtime and sleep quality, particularly prolonged sleep latency (Christensen et al., 2016). The second reason for changes in sleep latency may be increased daytime napping and depressive symptoms during confinement (Gupta et al., 2020), which potentially induce prolonged sleep-onset latency and the total increase in daily sleep duration, as found in this study. It is essential to highlight that women, who represent the majority of our participants, had poorer sleep quality compared to men, as confirmed by a recent study conducted in Saudi Arabia that reported that female gender and being married were associated with increased global PSQI scores, worsening of sleep latency, sleep quality, daytime dysfunction, and sleep distribution during home confinement (Alharbi et al., 2021).

4.2 Dietary habits during confinement

Regarding dietary habit changes during confinement, our results are consistent with recently published studies showing that COVID-19 home confinement had adverse effects on many nutritional habits, including increased frequency of main meals and snacks (Ammar et al., 2020; Sidor & Rzymski, 2020) and disruption of regular eating at the same time(AlMughamis et al., 2020)(Souza et al., 2022). These results may be explained by the prolonged home confinement in response to the lockdown caused by the COVID-19 pandemic (Alshammari et al., 2020). Consequently, individuals' daily schedules were disrupted, which affected their eating habits.

We found a significant reduction in regular eating from outside (takeaway and restaurants) during home confinement, with several possible explanations for this result. First, many countries applied lockdown restrictions, including Saudi Arabia. The lockdown situation in Saudi Arabia (which represents the origin country of most of our participants) forced delivery applications and restaurants to operate for limited hours each day to control the spread of the virus (Alshammari et al., 2020). Second, the anxiety of individuals about food hygiene when purchasing food from restaurants during this period may have reduced their intake (Alhusseini & Alqahtani, 2020).

4.3 Weight change during confinement

The results of this study regarding weight change during confinement are consistent with the previous research, which showed that 29.9% of participants reported an

increase in weight and 18.6% reported a decrease in weight during detention (Sidor & Rzymski, 2020). Despite the differences of the study sample and the study context, a recent study showed similar results with an increase in the body weight and the means of BMI for both genders among medical students during the second wave of the COVID-19 pandemic lockdown(Bhutani et al., 2021; Suganthi et al., 2023; Zeigler, 2021) These changes in body weight were explained by multiple differences during confinement, including changes in eating habits such as (frequency, content, timing, and regular meal times), sleep pattern, physical activity levels, and stress (Chew & Lopez, 2021; Sidor & Rzymski, 2020; Zeigler, 2021). In addition, these findings may be correlated with different individual characteristics, including age, gender, and education level, which may contribute to further weight changes among individuals during confinement (Chew & Lopez, 2021).

4.4 Association between sleep quality and eating habits

We found a significant association between main meals and sleep quality during confinement. Due to the cross-sectional nature of our study, the effect-cause remains unclear; however, poor sleep quality may lead to a reduction in central meal intake (≤3 main meals). Studies conducted during confinement to assess the relationship between sleep quality and consumption of main meals are lacking. However, a previous study conducted during regular periods (not during home confinement) showed that women with shorter sleep durations ate more snacks than main meals (S. Kim et al., 2011). Similarly, a review of 16 cross-sectional studies found that short sleepers had irregular eating patterns, shifting from the traditional three meals/d to more frequent calorie-dense snacks at night (Qin et al., 2003). Also, a recent study conducted during the COVID-19 pandemic found an increase in hours of sleep, a change in eating habits, a reduction of daytime meals, and increased intake of nighttime meals (Souza et al., 2022). Our results showed increased sleep duration, which could explain the weak association between sleep quality and number of snacks.

A short sleep duration is associated with increased snack intake for several reasons. First, individuals who had a short sleep duration tended to get up early and substitute breakfast with early morning snacks, as confirmed by a previous study that reported that skipping breakfast was high among individuals who had a short sleep duration, (Dashti et al., 2015) leading to increased frequency of snacks over main meals. Second, short sleep duration leads to extended hours of wakefulness, which provides additional opportunities for increased food intake, eventually resulting in weight gain. Similarly, the confinement situation provides individuals with prolonged time at home, which leads to a similar extended time as short sleepers in everyday situations. The lengthy time available to sleep may increase the frequency of snacks over main meals, which was observed in our results (longer sleep durations).

4.5 Strengths and limitations

This study included well-validated questionnaires (for example, PSQI). This is the first study to present a relationship between sleep quality and the number of main meals and snacks while focusing on poor sleep quality during home confinement. This is also the first study conducted with mostly participants from Makkah, Saudi Arabia, during home confinement. The limitations of this study include the small sample size compared with other studies (Alharbi et al., 2021; Trabelsi et al., 2021), the inclusion of more woman than men, and the cross-sectional study design, which limit the ability to infer that sleep quality causes a change in eating habits. Furthermore, sample size calculation was not conducted, and selection bias may have occurred owing to online advertisements in that only people with internet access were included in the study. However, this is also a positive aspect, as distant geographic areas could be included.

4.6 Recommendations and Research Needs

Individuals may need to boost their immune systems and other health outcomes during the COVID-19 pandemic by adhering to recommendations for sleep quality and eating habits. Suggestions for improving sleep quality include (Altena et al., 2020; Huang & Zhao, 2021) (I) keeping a regular schedule for waking and sleeping and avoiding long naps during the day; (II) being active; (III) not exposing oneself to epidemic news, especially before bedtime; and (IV) preventing the use of technological devices close to bedtime. Recommendations for improving eating habits include: (I) maintaining regular eating times; (II) consuming high-quality food; (III) limiting eating out (restaurants and take-aways) to avoid contact with other people; and (IV) consuming healthy snacks.

Further research is needed to understand better the changes in multiple lifestyle behaviours during the COVID-19 outbreak in all cities in Saudi Arabia. In addition, prospective studies with larger sample sizes and equal distribution of men and women are required to clarify better the relationship between sleep quality and dietary habits during home confinement.

5.CONCLUSION

COVID-19 home confinement may have a negative effect on sleep quality and eating habits. However, positive effects during confinement, such as reduced regular eating from the outside and decreased use of sleep medication, were observed. Good sleep habits and a healthy balanced diet are recommended challenging system to maintain health and boost the immune system during this challenging situation. Finally, public health officials need to increase people's awareness and provide recommendations to improve sleep quality and eating habits, especially during lockdowns.

AUTHOR CONTRIBUTION

Conception and design, E.N.; Methodology, E.N.; Data collection, E.N Statistical analysis, R.E Data interpretation, R.E and E.N.; Writing-original draft: R.E. Writing-

review and editing and E.N. All authors contributed to the article and approved the submitted version.

CONFLICT OF INTEREST

None.

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