



## Research Article

# The Impact of COVID-19 Restrictions on Dietary and Lifestyle Habits of Hamad Medical Corporation staff (Public healthcare workers in Qatar) - A Crosssectional Survey

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## Abstract

Health care workers are on the frontline in the fight against the COVID-19 pandemic which has resulted in many containment measures associated with dietary and lifestyle changes and probable constrained public health delivery.

**Objectives:** This study aims to determine whether COVID-19 induced restrictions have changed the dietary and lifestyle habits of Hamad Medical Corporation staff during the pandemic.

**Methods:** A descriptive cross-sectional online survey was conducted, collecting pre COVID-19 pandemic details and current information of dietary and lifestyle habits of HMC staff without any interventions. The data was collected using validated modified self-administered online questionnaire, to collect data on demographics, and to explore the impact of COVID-19 induced restrictions on diet and physical activity patterns, and lifestyle habits. The study received ethical clearance from MRC Qatar.

**Results:** The participants (n=248) were mostly female (57.3%) between the ages of 31-40 years (48.1%) all employed by Hamad Medical Corporation the principal healthcare provider in the State of Qatar. When BMI categories were grouped by gender 69.7% of females and 70.9% of males were found to be overweight. The data shows that vegetables consumption increased with 50% reporting an increase in fresh vegetables consumption but a decrease in fruits consumption and 31.5% reporting skipping 1 meal or more per day. Food items which were placed under the Sugar, Sweets and Others food group had a number of varied responses, with items like Jam 40.3%, soft/sugary drinks 22.2%, sugar 22.6%, ice cream 26.6% and pickles 25.0% being reported to have a higher percentage of being consumed more. Our results also show that 55.2% of participants in this survey do not engage in any specific physical activities, with 45.6% spending more than 4 hours per day doing sedentary activities. About 37.9% of participants decreased their sleeping time by 1-2 hours per day.

**Conclusion:** This study suggests that the COVID-19 pandemic and the containment restrictions triggered weight gain, inadequate intake of a balanced diet and physical inactivity among healthcare workers in Qatar.

**Keywords:** Dietary; Nutrition; Lifestyle habits; Covid-19; Healthcare workers; Survey

## Introduction

The World Health Organization (WHO) declared COVID-19 as a global pandemic on March 11, 2020, due to the worldwide spread of a novel coronavirus disease. Millions of health care workers-physicians, nurses, technicians, other health care professionals, and hospital support staff, as well as first responders including emergency rescue personnel, law enforcement officers, and others who provide essential services and products-around the world have faced the challenge of providing care for patients with COVID-19, while often ill-equipped and poorly prepared, risking their own lives to save the lives of others [1]. In addition to this study's efforts of identifying COVID-19's impact on nutritional health status of health workers, it discusses strategies and measures that aim to reduce the spread

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of COVID-19 and their unforeseen impact on dietary and lifestyle habits among health care workers. It further evaluates the consequences of conditions related to dietary and lifestyle habits that have been shown to cause severe complications and increase mortality from COVID-19 [1]. In order to contain the spread of the virus, national lockdowns characterised by restricted movement and social distancing have been the order of the day in many countries [1]. With the pandemic situation, public health recommendations and governmental measures have resulted in lockdowns and many restrictions on daily living, including isolation, social distancing, remote work and home confinement. Although these measures may help reduce the rate of infection, such activity limitations may result in negative effects by restricting participation in normal daily activities like physical activity, travel and access to many forms of exercise [2]. On top of the initially encouraged social distancing by the beginning of March 2020, the State of Qatar Government implemented more stringent containment measures in order to contain the spread of the new COVID-19: which included closing gyms, parks, public swimming pools, entertainment centres and hotels [3].

## Methods

A descriptive cross-sectional survey was conducted to describe dietary and lifestyle habits using an online-survey platform (Survey Monkey, California, USA), carried out by the HMC, Hazm Mebareek General Hospital (HMGH) Dietetics and Nutrition department staff. The study design collected pre COVID-19 pandemic restriction details and current information of dietary and lifestyle habits of HMC staff without any interventions. The survey link was disseminated through institutional contacts on (ITAWASOL-organisational website) given the social distancing measures due to ongoing COVID-19 pandemic. Participants were recruited in the study using a convenience sampling method (n=248), this was a rapid appraisal of the perceptions on COVID-19 lockdown on nutrition, health and lifestyle indicators among workers from HMC facilities in QATAR.

## Tools and Materials

The survey link had an information letter attached explaining how to fill the questionnaire also detailing the aim and objectives of the study, consensual agreement to voluntarily participate, strict adherence to anonymity or privacy and the right to withdraw anytime should they wish to. The data was collected using a 32 questions validated modified self-administered online questionnaire, to collect data on demographics and to explore the impact of COVID-19 induced restrictions on diet and physical activity patterns and lifestyle habits. The questionnaire was divided into four sections namely, demographics/ personal information (i.e. age, gender, nationality and current employment), anthropometry (current weight, usual weight and height), nutritional information (had a total of 10 questions e.g. Compared to before COVID-19 pandemic has the number of your daily meals changed? responses coded as; 0= No, did not change, 1= Yes, I skip 1 or more of the main meals (breakfast, lunch, dinner), 2= Yes, I added 1 or more of the main meals, 3=

Yes, I skip 1 or more of snacks between meals, 4= Yes, I added 1 or more of the snacks between meals), and lifestyle habits. Data was collected de-identified, codes were used to cover participant identifiers such as age, gender, weight and height.

## Data Analysis

Collected data was double checked by researchers for completeness before it was entered into a data base. The questionnaire was coded using web-survey (Survey Monkey, California, USA), for identification to avoid repetition of data. Data collected from the online questionnaire was entered and analyzed using SPSS v 28 (IBM Inc. Armonk, NY). Continuous data was presented as mean  $\pm$  standard deviation (SD), while categorical data presented as frequencies and percentages. Pearson's Chi-square was used to explore associations for categorical variables and continuous variables respectively. Paired samples T test was used to test for difference in means across continuous normally distributed variables. The level of significance was set at  $P < 0.05$ .

## Ethics

The study was conducted based on the ethical principles of respect, justice and confidentiality summarized in the 2013 Declaration of Helsinki Good Clinical Practice. Prior to conducting the study, the study protocol was submitted to the Qatar, Medical Research Center (MRC) for approval which is in line with laws and regulations of Ministry of Public Health in Qatar. To give the respondents a choice if they want to participate in the study, an information letter was attached on the online data collection tool, for each participant in which it is indicated that participation in the study is based on informed consent.

## Results

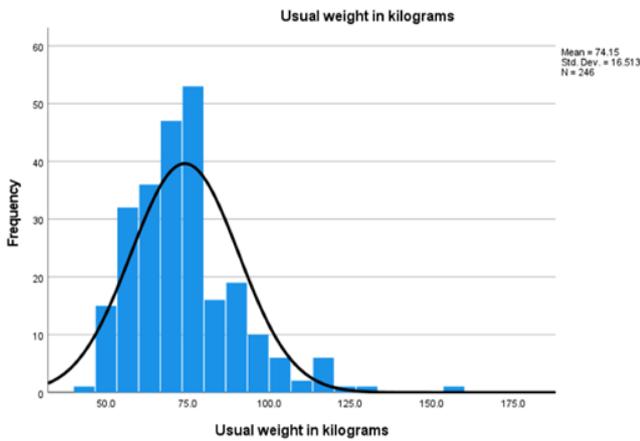
### Demographics

On the 24th of November 2021, the online survey was stopped, and the collected data was assessed and prepared to be analysed. In total 248 participants took part in the survey majority were between the ages of 35-40 years (41.9%) and most were female (57.3%). From our total number of participants, most were employed as Nurses/Midwife (35.9%), and 94.0% were Non Qatari nationals (Table 1).

Participants were firstly asked about their weight changes prior to reporting their usual weight, height and current weight, mostly 53.2% reported to have gained weight, while 23.0% thought they had lost weight and the rest reported no changes during the COVID-19 lockdowns. The reported usual weight had a mean of 74.15kg (Figure 1) and current weight a mean of 77.2kg (Figure 2) which shows an increase of 3.05kg (4.1%) among participants who reported their weight. BMI or Body Mass Index was calculated using current weight in kilograms and height in meters and the mean BMI was found to be 28.3kg/m<sup>2</sup> (Figure 3), which can be classified as overweight. When BMI categories were grouped by gender 69.7% of females and 70.9% of males were found to be overweight (Table 2).

**Table 1:** Demographics.

Variables	n	%
<i>Age Groups</i>		
18-24 Years	4	1.6
25-34 Years	86	34.7
35-44 Years	104	41.9
45-54 Years	37	14.9
55-64 Years	14	5.6
65+ Years	3	1.2
<i>Gender</i>		
Female	142	57.3
Male	106	42.7
<i>Nationality</i>		
Qatari	15	6
Non Qatari	233	94
<i>Current employment</i>		
Physician/Dentist	18	7.3
Nurse/Midwife	89	35.9
Allied Health	73	29.4
Administrative	51	20.6
Support service	14	5.6
Other	3	1.2



**Figure 1:** Usual Weight in Kilograms

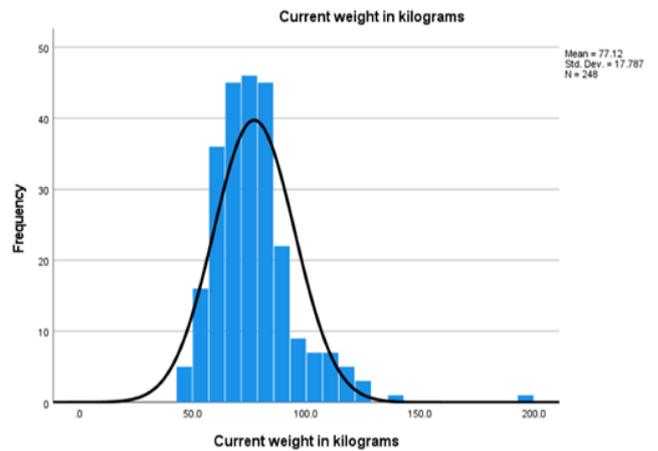
**Nutritional information**

The results show that 38.7% of participants have changed their eating patterns by having more home cooked meals, 35.1% are snacking more often than usual and 30.6% reported to be eating more food more often than usual since the beginning of the COVID-19 pandemic (Table 3). A total of n=55 participants (22.2%) relay to be having more take away meals and 23% of participants opting for healthier options.

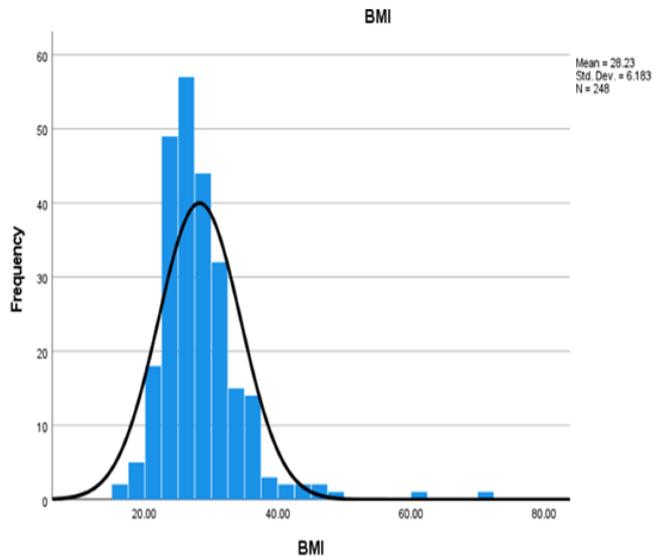
Participants were asked to select from a list of food items that they have been consuming more and those that they have been eating less since the COVID-19 pandemic (Table 4). The

data shows that vegetables consumption increased with 50% reporting an increase in fresh vegetables consumption, 38.3% increased frozen vegetables consumption and canned vegetables consumption showed a higher percentage of less consumed 10.9% than the percentage (7.7%) of those who increased canned vegetable consumption. Contrary to vegetables, fruits were consumed less by more participants 8.1% than those who consumed more 3.2%. On the other hand, milk, dairy products and alternatives had most participants consuming more, with low fat or skimmed milk products leading the pack at 22.6%, followed by full fat milk and milk products which were consumed more by 11.3% (Table 4).

From cereals and starches surprisingly, macaroni/pasta were consumed more by our participants 41.1% followed by rice at 31% and breads/pastries were less consumed by 11.7% than those who ate more at 3.6%. The Fish, poultry, meat and alternatives food group generally had more participants consuming more since the COVID-19 pandemic ensued, with most participants



**Figure 2:** Current weight in kilograms.



**Figure 3:** BMI from current weight

**Table 2:** BMI by Gender.

BMI Categories (Kg/m <sup>2</sup> )	Gender	
	Female (%)	Male (%)
<18.5	3.5	0
>18.5-24.9	26.8	29.2
>25-29.9	69.7	70.8

**Table 3:** Change in eating habits.

Responses	How have you changed your eating habits since the COVID-19 pandemic?	
	n	%
Did not change	36	14.5
More home cooked meals	96	38.7
Less take away meals	41	16.5
More take away meals	55	22.2
Snacking more often than usual	87	35.1
More pre-made meals	23	9.3
Eating more food more often than usual	76	30.6
Eating less food less often than usual	33	13.3
Opting for healthier options	57	23
Opting for less healthy options	25	10.1
Snacking less often than usual	10	4
Increased the number of meals shared with family or friends	54	21.8
Decreased the number of meals shared with family or friends	37	14.9

45.2% consuming more fish and 42.3% participants consuming more red meat (Table 4). Food items which were placed under the Sugar, Sweets and Others food group had a number of varied responses, with items like Jam 40.3%, soft/sugary drinks 22.2%, sugar 22.6%, ice cream 26.6% and pickles 25.0% being reported to have a higher percentage of being consumed more and a lower percentage of being consumed less. On the same category there was a number of items which had a higher percentage of being consumed less such as sugar free drinks 26.6%, sweets 12.9%, cakes 29.4%, chocolates 23.0%, and nuts 12.5% which was higher than the same foods percentage of being consumed more (Table 4). In addition to the type of food that is being consumed either more or less since the pandemic, data of the number of daily meals was collected with 33.8% of participants reporting that their total meals per day did not change and 31.5% reporting skipping 1 meal or more per day (Table 5). Most of these meals are homemade meals 19.4%, as 55.6% of participants also reported to be eating less from restaurants since the pandemic. From all participants a total of 25% said they eat at restaurant more than before the pandemic although these responses could mean food ordered in from restaurants (Table 6). With the likelihood of the pandemic

restrictions 48.4% of all participants are ordering in food more often than before the pandemic instead of going to eat at restaurants (Table 7).

Another aspect that we enquired about which might have been affected by the COVID-19 pandemic or its control measures is how people do their physical activity, our results show that 55.2% of participants in this survey do not engage in any specific physical activities. Majority (44.8%) of those who do some sort of physical activity, about 27.0% do it for 30-60minutes/day, and mostly 34.3% do it twice per week since the introduction of COVID-19 control measures. The types of physically activities which are done by most participants include dance (30.2%), running (28.2%) and swimming (14.1%) (Table 8). 70.6% of administration staff spend more than 4 hours per day is doing sedentary activities like watching television, working on a desktop/laptop, playing computer/television games, on social media, reading or singing, followed by allied health care workers at 46.6% (Table 9). Generally, all participants reported an increase in sedentary activities (Table 10). Sleep duration has also been disturbed with a total of more than 52.4% of respondents reporting a minimum of 1 hour of sleeping increase.

## Discussion

In the present study, we provided for the first-time data on the impact of the COVID-19 restrictions on dietary and lifestyle habits of health care workers in Qatar. However, there are still lots of unknowns concerning the COVID-19 pandemic that is still ongoing, thus our data need to be confirmed and investigated in future studies. In a recent study it was found that quarantine negatively affected the physical activity of an active population, especially those of males, overweight people, and senior adults and the elderly [2]. Our results concur in that we reported that 55.2% of participants do not do any physical activity, although we did not enquire about probable increased work load given the work environment of the study population since the pandemic ensued. An international study also indicated an increase in daily sitting time from 5 to 8 hours per day during pandemic restrictions [4], although the population groups were not similar to the current study, but about a third (61.2%) of participants spent more than 4 hours on sedentary behaviour. It should be noted that before this pandemic, insufficient physical activity and obesity were described as a global public health problem [5], we recorded a high percentage of health care workers who do minimal or no physical activity at all since the pandemic and containment measures came to effect. A Middle East and North African study with (n=54) 1.8% participants from Qatar recently relayed that during the pandemic, over 30% reported weight gain, 6.2% consumed five or more meals per day compared with 2% before the pandemic ( $P < 0.001$ ) and 48.8% did not consume fruits on a daily basis [6]. These lead to an increased risk of overweight and obesity among the middle and higher income earning groups [7], most participants in this present study reported weight gain since the pandemic containment measures and they are overweight. Which raises concern considering that obesity is a risk factor

**Table 4:** Food that is consumed more or less.

Food Groups	Food that is consumed More than before the COVID-19 pandemic		Food that is consumed Less than before the COVID-19 pandemic	
	n	%	n	%
<b>Vegetables</b>				
Fresh vegetables	124	50	65	26.2
Frozen vegetables	95	38.3	47	19
Canned vegetables	19	7.7	27	10.9
<b>Fruits</b>				
Fresh fruits	8	3.2	20	8.1
Fruit juice	12	4.8	26	10.5
<b>Cereals &amp; Starch</b>				
Breads/Pastries	9	3.6	29	11.7
Rice	77	31	39	15.7
Macaroni/Pasta	102	41.1	42	16.9
<b>Legumes</b>				
Legumes	33	13.3	31	12.5
<b>Milk, Dairy products &amp; Alternatives</b>				
Full fat milk or milk products	28	11.3	18	7.3
Low fat or skimmed milk products	56	22.6	35	14.1
Laban	17	6.9	15	6
Labna	36	14.5	14	5.6
<b>Fish, Poultry, Meat &amp; Alternatives</b>				
Eggs	21	8.5	20	8.1
Fish	112	45.2	26	10.5
Chicken/Poultry	84	33.9	33	13.3
Red meat	105	42.3	26	10.5
Processed meat	62	25	40	16.1
Canned fish	24	9.7	45	18.1
<b>Sugar, Sweets and Others</b>				
Soft drinks/Sugary drinks	55	22.2	34	13.7
Sugar free drinks	56	22.6	66	26.6
Sweets	15	6	32	12.9
Cakes	67	27	73	29.4
Sugar	56	22.6	55	22.2
Chocolates	32	12.9	57	23
Ice cream	66	26.6	48	19.4
Tea	56	22.6	37	14.9
Coffee	59	23.8	19	7.7
Jam	100	40.3	27	10.9
Nuts	15	6	31	12.5
Pickles	62	25	27	10.9
Fatayer/Pizza	38	15.3	35	14.1
Other	12	4.8	10	4
None of the above	12	4.8	5	2

**Table 5:** Change in total daily meals

Has the number of your daily meals changed than prior to the COVID-19 pandemic?		
Responses	n	%
No, it did not change	84	33.8
Yes, I skip 1 or more of the main meals (Breakfast, lunch and dinner)	78	31.5
Yes, I added 1 or more of the main meals	24	9.7
Yes, I skip 1 or more snacks between meals	19	7.7
Yes, I added 1 or more snacks between meals	43	17.3
	248	100%

**Table 6:** Frequency of eating out

How frequent do you eat at restaurants now compared to before the COVID-19 pandemic?		
Responses	n	%
I do not eat out/ I depend on homemade meals	48	19.4
I eat at restaurants more often than before	62	25
I eat at restaurants less often than before	138	55.6
	248	100%

**Table 7:** Food ordered in since covid-19 restrictions.

How has ordering in food for delivery changed, compared to before the COVID-19 pandemic?		
Responses	n	%
I do not order in/ I depend on homemade meals	53	21.4
I order in more often than before	120	48.4
I order in less than before	75	30.2
	248	100%

**Table 8:** Types of physical activity.

Type of physical activity	n	%
Running	70	28.2
Swimming	35	14.1
Yoga	21	8.5
Brisk Walking	19	7.7
Dance	75	30.2
Cycling	12	4.8
Skipping rope	23	9.3
Aerobics	5	2
Soccer/Basketball/Volley ball/Squash/Netball	19	7.7
Gymnastics	12	4.8
Gym	1	0.4
Other	40	16.1

**Table 9:** Current employment compared with sedentary activities.

Time spent doing sedentary activities/day	Current employment						
	Physician/ Dentist	Nurse/Midwife	Allied Health	Administration	Support Services	Other	Total
30 min/less	11.10%	18.00%	4.10%	0.00%	0.00%	33.30%	8.90%
1hours/less	5.60%	13.50%	12.30%	5.90%	21.40%	0.00%	11.30%
2hours/less	38.90%	19.10%	17.80%	7.80%	14.30%	0.00%	17.30%
3hours/less	22.20%	12.40%	19.20%	15.70%	28.60%	33.30%	16.90%
4hours/more	22.20%	37.10%	46.60%	70.60%	35.70%	33.30%	45.60%
P Value 0.00-0.001							

**Table 10:** Sleeping duration.

Responses	Has the number of hours you sleep per night changed since the pandemic?	
	n	%
No, it has not changed	118	47.6
Yes, increased by 1 hour	18	7.3
Yes, increased by 2 hours	18	7.3
No, decreased by 1 hour	38	15.3
No, it decreased by 2 hours	56	22.6
Total	248	100

for severe COVID-19 infection complications, with healthcare workers being likely to be more exposed to the COVID-19 positive patients and at high risk of being infected [8]. Adequate physical activity has a preventive role as a nonpharmacological aid for health in this period [9], and the WHO has developed guidelines which include home based safe physical activities to adopt during home quarantine which could be reinforced beyond the COVID-19 pandemic [10]. People tend to overeat foods rich in sugar ‘comfort foods’, when they are stressed, due to food craving [11,12], one of those includes ice cream which had an increased consumption by most participants in this current study. Food craving effect of carbohydrates is proportional to the glycemic index of food that is associated with the increased risk of developing obesity and cardiovascular diseases, beyond a chronic state of inflammation, that has been shown to increase the risk for more severe complications of COVID-19 [13], and the present study recorded a high intake of high GI food since the pandemic. Despite all these, the COVID-19 containment measures have their benefits in “flattening the curve” they also have potential downsides such as increased stress, reduced physical activity, limited availability and access to diverse nutritious foods and health services [14]. In addition, lockdown related stress and anxiety has potential to trigger carbohydrate cravings resulting in increased energy intake thus giving rise to a dangerous vicious cycle [15]. Unfortunately [13] it was observed that this food craving is often associated with the increased risk of developing obesity and cardiovascular diseases and has also been linked with increased risk of more serious complications of COVID-19 [16]. Obesity

rates in the Middle East and North African region are already alarmingly high and are associated with non-communicable diseases such as type 2 diabetes, CHD and stroke [6]. The population of the current study is mostly healthcare workers or essential service workers who are needed in the fight against the mentioned non communicable diseases, while they themselves are now at increased risk of being diagnosed with the same diseases. This pandemic may make it an even bigger challenge to maintain a healthy and varied diet, as well as a regular physical activity by health care workers who are on the frontline in the fight against the COVID-19 pandemic [17]. For instance, limited access to daily grocery shopping was hypothesized to lead to a reduction in consumption of fresh foods, especially fruit, vegetables and fish, in favour of highly processed ones, such as convenience foods, junk foods, snacks, and ready-to-eat cereals, which tend to be high in fats, sugars, and salt and are readily available. But due to probable better healthy eating knowledge of those in the healthcare setting, with the Qatar Dietary Guidelines being widely instilled in HMC, vegetables consumption increased, and as predicted fruits consumption decreased in this study. Interestingly in another recent study on the effect of COVID-19 on dietary and lifestyle habits they observed an increase in consumption of ‘dark green’ leafy vegetables consumption 33.72% [18], which shows application of nutritional knowledge in boosting the immune system. It is therefore important to maintain a healthy body weight and consume a diverse and nutritious diet to mitigate COVID-19 infection through the immune boosting mechanism [19, 20]. It is known that individuals who eat a well-balanced diet tend to be

healthier with lower risk of obesity and other non-communicable diseases [18,21]. In addition, [15] it has been proven that these individuals will have stronger immune systems and reduced risk of contracting infectious diseases like COVID-19 [20]. About 1 third of the participants in the current study reported to skip 1 or more of their usual main meals. The mandatory use of personal protective equipment (PPE) due to COVID-19 within the health settings which includes wearing of masks, face shields and gloves, combined with the fear of contracting COVID-19 [21], may cause health facility workers who are dealing with COVID-19 to avoid removing their PPE even when they need to eat, leading to skipping of meals during work by many health care workers. In another recent study [22], about 62% of participating health care workers were only able to eat after duty hours which can take up to 12 hours of strict contamination safety procedures while the remainder were still able to take in fluids prior to dining, less than 50% were able to consume 500-1000ml liquids per shift. Although the reasons for skipping meals were not stated in this current study, participants started skipping meals since the pandemic and containment measure were introduced.

During the COVID-19 pandemic, people are exposed to a stressful situation for an unknown duration of time, this could disrupt sleep quality, which has a direct effect on the physical functioning during the subsequent day [6]. Our study found an insignificant but noticeable decrease in sleep hours during the pandemic. In addition, a survey in China indicated that 18.2 % of participants had poor sleep quality, and the percentage increased to about 24% among healthcare workers [23]. More specific studies assessing the impact of COVID-19 on the mental health of health care workers in our society could be beneficial.

## Conclusion

This study suggests that the COVID-19 pandemic and the containment restrictions triggered weight gain, inadequate intake of a balanced diet and physical inactivity among healthcare workers in Qatar. This translates to health care workers increased risk of overweight and obesity which is associated with non-communicable diseases such as type 2 diabetes, CHD and stroke, hence the need for programmes to closely monitor health worker's nutritional status and provision of reliable support during this pandemic and beyond.

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## Conflict of interest

All authors declare no conflict of interest.

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