

## Impact of COVID-19 Quarantine on the Physical Condition of Residents in Saudi Arabia

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Received Date: 06-16-2020; Published Date: 07-06-2020

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### Abstract

*The importance of physical activities to individuals of all ages is not up for discussion because the medical and physiological impact is widely known and understood. Furthermore, it is important to avoid sedentary behavior or lifestyle for a long period. Quarantine is the separation and restriction of movement and direct contact of people who have a potential risk of a contagious disease. This differs from isolation in which isolation is a medical separation of people diagnosed with an infectious disease and carries a real risk of spreading the disease to others. The potential health drawbacks of the mandatory mass quarantine need to be highlighted from different prospective related to medical conditions, psychological effects, physical de-conditioning, and obesity. As the restriction of movement and prolonged homestay directly reflects the time, duration, and type of physical activity, it is expected that these factors will decline in the majority of the quarantined community. Therefore, this study was designed to investigate the quarantine impact on physical activity and related aspects. A cross-sectional, analytical, comparative study using an anonymous electronic survey to the general population aged 20 to 60 years was done in which it showed a self-reported change. The survey covered aspects related to physical activity, sleeping hours, weight changes, and the rate of food intake before and during COVID-19 quarantine. The response rate was 54%. The result shows a trend of an increase in weight of 56.50% and an increase in sleeping hours. Simultaneously, there is a trend of decreasing physical activities both in walking and in gym work of 42.4 and 41.3 percent, respectively.*

### Conclusion

*There is an effect on physical status. The co-factors such as the rate of food intake and sleeping also affect the total body status. With the prolonged quarantine, these figures are subject to increase consequently and the drawback on health status may drop to a considerably large percentage in the community.*

## Keywords

COVID-19; Physical Activities; Quarantine; Sedentary; Walking; Gym; Food; Sleep.

## Introduction

The importance of physical activities to individuals of all ages is not up for discussion because the medical and physiological impact is widely known and understood. Existing trends in the research of physical activity deserve extensive implementation. There is notable growing evidence to refer to the potential risk threshold for health issues as related to the degree of physical activity or inactivity. As such, evidence would suggest that there is an optimum amount of time one should spend in performing physical activities for it to promote or stimulate health effects, and there is also evidence to show that there is an optimum amount of time that is spent at rest resulting in sedentary behavior which is more likely to develop into a chronic disease. The important message, therefore, is that being physically active is not enough. One also needs to avoid being in a sedentary behavior or lifestyle for a long time [1]. Quarantine is the separation and restriction of movement and direct contact of people who have the potential risk of contagious disease. This differs from isolation, which is the medical separation of people who have been diagnosed with the disease and carries a real risk to others; however, these two terms are usually used interchangeably, especially when there is epidemic spread in the community. Quarantine was first known for over 1400 years ago when the prophet Mohammed peace is upon him instructed Muslims to remain isolated outside the contagious zone and not to leave the affected zone until the epidemic is resolved. The word quarantine was first scientifically announced in Venice, Italy in 1127, because of leprosy and was also extensively used in response to the pandemic Black Death. However, it was not until 300 years later that the UK government began to impose quarantine in response to an outbreak. Recently, quarantine has been globally imposed upon the coronavirus disease 2019 (COVID-19) pandemic [2]. This outbreak has hit the entire cities in China but was effectively controlled by mass quarantine of millions of citizens. Yet, thousands of foreign nationals chose to return to their countries taking with them the risk of infection even with the direction to self-isolate. In this century, there are two precedents for such measures: (1) Quarantines were imposed in areas of Canada and China during the 2003 epidemic of Severe Acute Respiratory Syndrome (SARS). (2) Entire villages in many West African states were tightly quarantined during the 2014 Ebola outbreak. Quarantine for the most part is an unpleasant and difficult exercise. It impacts many life aspects e.g. shopping, work, business, school attendance, canceling of an urgent and important meeting, an increase of suicide attempts, and exaggeration of psychological status. The potential health drawbacks of the mandatory mass quarantine need to be highlighted from different prospective related to medical conditions, psychological effects, physical de-conditioning, and obesity [3]. Motor skills need to be maintained. The circulatory and neuro-muscular systems need to be activated every day. The in-house activities are important to maintain the internal organs functioning in harmony. De-condition can induce a demotion cascade to all body functions including digestion and metabolic function [4]. World Health Organization (WHO)

announced that adults aged 18 to 64 years should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week or an equivalent combination of moderate- and vigorous-intensity activity [5]. Quarantine has derailed the lives of all ages all over the world. Evidence has shown that when an adult is off work, such as for holidays and weekends, they are physically less active, eat unhealthy foods, have longer screen times, and have irregular sleep time; all of which are associated with muscle weakness, weight gain and obesity. Such negative effects on health status are likely to be much worse when confined to homes without outdoor activities during an outbreak [6]. The COVID-19 pandemic does not affect all populations with the same severity. Elderly individuals living in nursing homes or long-term care facilities, and individuals with compromised immune systems are at the highest risk of contracting COVID-19. However, many others are vulnerable to the pandemic, such as people experiencing homelessness and individuals suffering from food, housing, and job insecurities, particularly populations that are experiencing social inequalities. Therefore, there is an expected impact on the physical status of the quarantined community and this study aims to investigate these quarantine impacts on physical condition and related aspects [7].

## Method

A cross-sectional, analytical, comparative study using an anonymous electronic survey to the general population aged 20 to 60 years was done in which it showed a self-reported change. The survey covered aspects related to physical activity, sleeping hours, weight changes, and the rate of food intake before and during COVID-19 quarantine. The response rate was 54%. Data were uploaded to the EXCEL and SPSS packages for statistical analysis. Data were then expressed in a comparative mode of before and during outcomes, and then expressed in figures and tables. A statistical difference was calculated on the average before and during COVID-19 using the independent t-test and the Mean ( $\pm$  SD) before and during COVID with a p-value calculation. Also, relative comparisons of many non-significant aspects were drawn.

## Results

The majority of the study participants were males with a percentage of 84.8. Most of them, 45.7% were in the age group 51-60 (Table 1). The Mean ( $\pm$  SD) age of participants was 46.04 ( $\pm$  10.42) years. The Behavioral changes in the study participants were detailed in Table 2. It was found that in 30.4% the average sleep hours before COVID-19 were 6 hours and it has been increased to 8 hours in 33.7% subjects during COVID-19. A statistical difference was found between the average sleep hours before and during COVID-19 using the Independent t-test. The Mean ( $\pm$  SD) sleep hours before and during COVID-19 were 6.55 ( $\pm$  1.12) hours and 7.12 ( $\pm$  1.32) hours respectively with a p-value 0.002 which was statistically significant. Before COVID-19 the Gym activity rate was highest in 28.3 percent participants and the activity rate was 3 times a day and was decreased during COVID to NO ACTIVITY in 41.3 percent participants. Around 30.4 % were not at all concerned about walking and 32.6% were

taking 5000 steps before this pandemic. During this pandemic, most of the participants (42.4%) were not concerned about walking at all (Table 2).

**Table 1:** Demographic details of study subjects.

Variable	Frequency (Percentage)
Gender	
Male	78 (84.8)
Female	14 (15.2)
<b>Total</b>	<b>92 (100)</b>
Age (in years)	
21-30	10 (10.9)
31-40	17 (18.4)
41-50	23 (25)
51-60	42 (45.7)
<b>Total</b>	<b>92 (100)</b>

**Table 2:** Behavioral changes in subjects before and during COVID-19.

Particulars	Frequency (Percent)
1. Average sleep hours before COVID-19	
5 hours	19 (20.7)
6 hours	28 (30.4)
7 hours	22 (23.9)
8 hours	21 (22.8)
9 hours	2 (2.2)
<b>Total</b>	<b>92 (100)</b>
2. Average sleep hours during COVID-19	
5 hours	15 (16.3)
6 hours	16 (17.4)
7 hours	17 (18.5)
8 hours	31 (33.7)
9 hours	13 (14.1)
<b>Total</b>	<b>92 (100)</b>
3. Gym activity rate before COVID-19	
No activity	20 (21.7)
1 time	15 (16.3)
2 time	15 (16.3)
3 time	26 (28.3)
Daily	16 (17.4)
<b>Total</b>	<b>92 (100)</b>
4. Gym activity rate during COVID-19	

<b>No activity</b>	<b>38 (41.3)</b>
<b>1 time</b>	<b>12 (13)</b>
<b>2 time</b>	<b>10 (10.9)</b>
<b>3 time</b>	<b>14 (15.2)</b>
<b>Daily</b>	<b>18 (19.6)</b>
<b>Total</b>	<b>92 (100)</b>
5. Walking step rate before COVID-19	
<b>5000</b>	<b>27 (29.3)</b>
<b>7000</b>	<b>10 (10.9)</b>
<b>10,000</b>	<b>12 (13.1)</b>
<b>&gt;10,000</b>	<b>15 (16.3)</b>
<b>Not concerned</b>	<b>28(30.4)</b>
<b>Total</b>	<b>92 (100)</b>
6. Walking step rate during COVID-19	
<b>5000</b>	<b>30 (32.6)</b>
<b>7000</b>	<b>8 (8.7)</b>
<b>10,000</b>	<b>9 (9.8)</b>
<b>&gt;10,000</b>	<b>6 (6.5)</b>
<b>Not concerned</b>	<b>39 (42.4)</b>
<b>Total</b>	<b>92 (100)</b>
Happy to stay home	59 (73.3)
Not happy to stay home	30 (26.7)

**Figure 1:** Pattern of meal consumption before and during COVID.

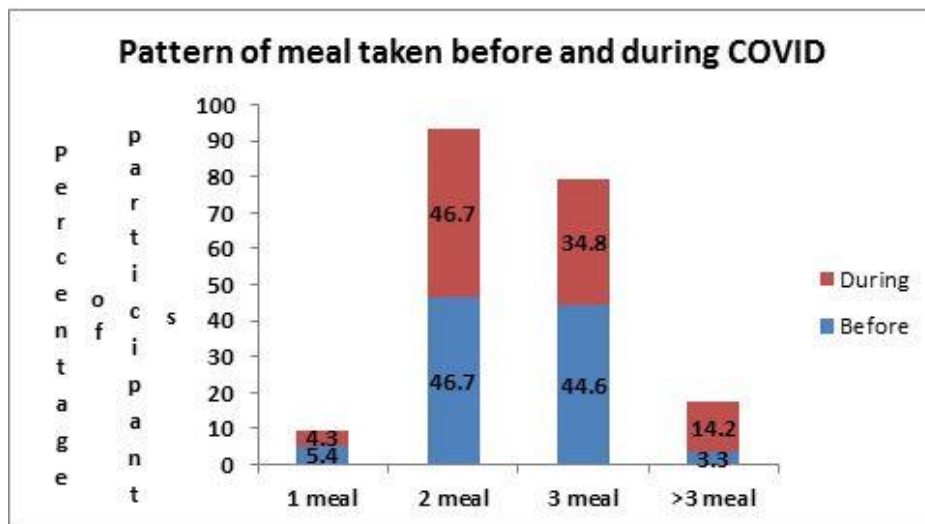
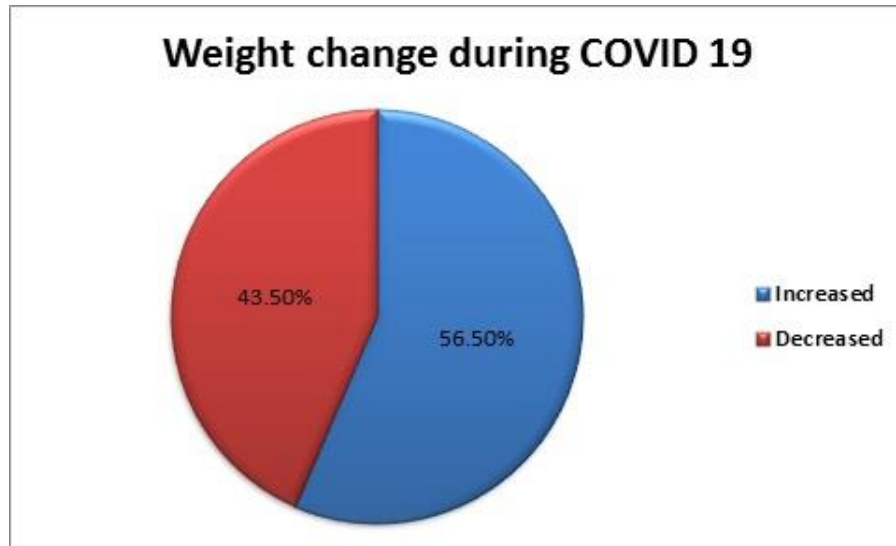


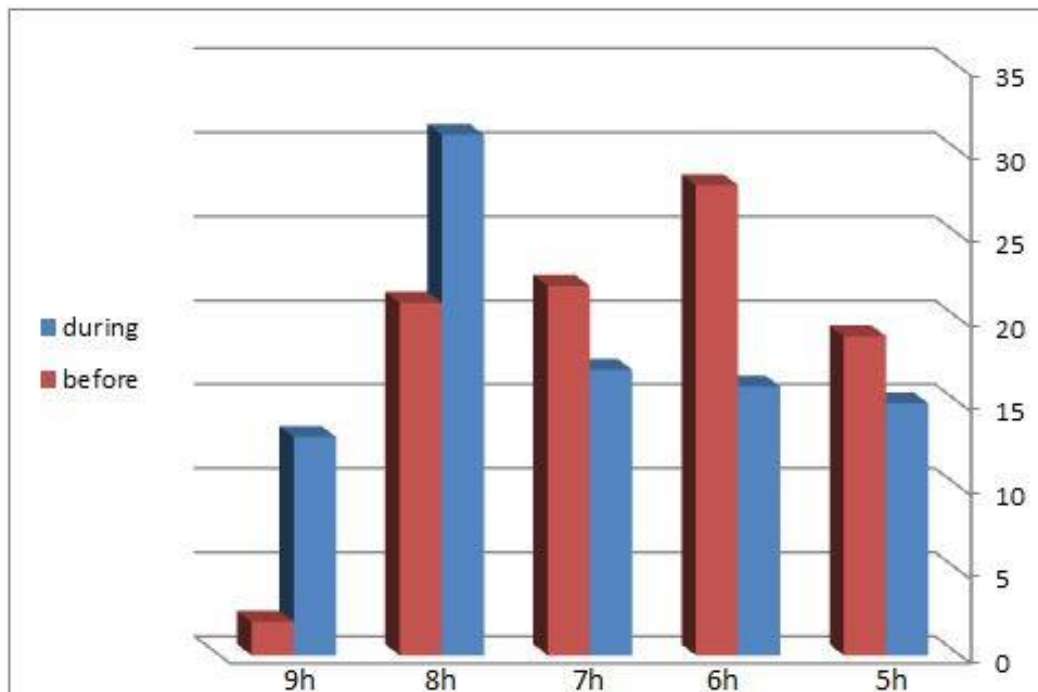
Figure 1 describes the number of meals taken per day before and during the COVID. Forty-seven percent were taking 2 meals a day before and during COVID. During this pandemic, 34.8% were taking 3 meals per day during COVID. 14.2% of participants were consuming >3

meals a day during COVID and was 3.3% before COVID. The majority (56.5%) have opined that their weight has increased during this COVID-19 in Figure 2.

**Figure 2:** Pie diagram with weight change during COVID-19.



**Figure 3:** Average sleep hours before and during COVID-19.



The use of social media, TV, and reading was found remarkably increases. The majority of the sample was happy to stay home versus the wishes to practice normal life. The physical activities (walking and gym) were found slightly reduced. Sleeping hours have a trend to

increase by 2hs in the majority. Generally, the quarantine has a negative impact on physical status.

## Discussion

The quarantine is a mandatory community restriction of movement and contacts, thus, it is expected to reduce or stop the regular sports activities; similarly, the regular daily duties that require physical movement. The link between health and exercise has become obvious and evident because exercise strengthens the heart, lungs, and improves circulation, i.e. increased blood flow causes an increase in oxygen levels in the body. Exercise helps lower the risk of heart diseases such as high cholesterol, coronary artery disease, and heart attack. Regular exercise can lower blood pressure and triglyceride levels as well as reduce stress and improve cognitive function. It also affects the metabolic process [6,8]. Therefore, the potential benefits of mandatory mass quarantine need to be weighed carefully against the possible health costs. The results of this study showed that the majority (70.3%) is accepting the quarantine rules and following them nicely. However, the lifestyle is changed as to food and outdoor activities, and the acceptance of these changes varies from one person to another. Overall, the food habits, types, and preparations were found to be better during the quarantine since most of the vast majority were converted to be home-dependent food. With regards to the rate of activities like gym workout and walking, the overall impression is a decline relative to before the quarantine 41.3 of 42.4 percent, respectively. The disproportion of increased sleeping hours (by almost 2hs) and food intake with reduced activity levels will consequently lead to a serious decline in health. A strong connection between health and physical activity was highly addressed in the medical community and emphasized by the World Health Organization (WHO) [5]. Many clinical pieces of research strongly linked the good and bad health conditions to the intensity and duration of the physical activities of the individuals [3,4]. Physical activities and exercise should be viewed as a medical treatment because of the many health benefits associated with them. Like in many cases of chronic illnesses, the health benefits of physical activities and exercise exceed the health benefits of conventional medications.  $\beta$ -blockers commonly used in the treatment of hypertension and other cardiovascular illnesses result in reduced resting heart rates which are comparable to the reductions found with regular physical exercise participation. Because of these health benefits, physical activities and exercise are now an essential part of the medical plan for several chronic diseases. One of the most recognized benefits of using exercise is the absence of side effects, contrary to those found with the use of classic medications. Unlike traditional medications that mask the signs and symptoms or unnaturally alter physiologic functioning, exercise, on the other hand, changes the underlying mechanisms for physiological functioning. Physical activities (PA) are now considered the principal prescriptions for use in primary and secondary prevention of chronic illness [9]. There is an associated effect on the physical status and the co-factors (rate of food intake and sleeping), which also affect the total body status [1,3,4] which this study also confirmed. With the prolonged quarantine, these are subjected to increase consequently and a major drawback on the health may occur to a considerably large percentage in the community.

## Recommendations

1. Longer quarantine is associated with negative physical outcomes. Therefore, it is recommended to restrict the quarantine of the possible shortest duration [10].
2. Give people as much information as possible. Ensure that those under quarantine have a good knowledge of the disease in question and understand the reasons for quarantine, with emphasis on the importance of maintaining physical activities. Access to information and advice resources must be facilitated and made available to everyone 24 hours in several ways such as in writing, voice, social media, etc.
3. Chronic disease patients who need regular indoor or outdoor physical activities must receive a complimentary activity schedule.
4. A comprehensive large scale study is required to draw specific categorized results.
5. The maintenance of physical health is not reflected in global quarantine strategies. The WHO Sustainable Development Goals and the Global Action Plan for the Prevention and Control of Non-Communicable Diseases, for example, have their main focus on physical health.
6. The age distribution of participants at a study indicates that we did not have data of the children or very old people, and this will need special focus in another study.
7. These findings suggest that the policy and health care practice addressing physical health issues in the community context could be effective strategies in reducing the total health impact.

## Limitations

The age distribution of participants at this study indicates that we did not have data of the children or very old people, and this will need special focus in another study. An experimental measurement on weight and physical activities would make the work more convenient.

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