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## A Study on Impact of Covid-19 on the Nutrition & Exercise Regime of Lifestyle Disorder Patients (Non-Communicable Disease)

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### ABSTRACT

The COVID-19 pandemic has significantly altered people's eating and activity habits all around the world. Lockdowns and social isolation policies have altered daily routines, changed people's levels of physical activity, and changed how they eat. The goal of this study is to comprehend how the pandemic has affected people with lifestyle problems, notably non-communicable diseases (NCDs), and their dietary and exercise habits. The goal of this study is to fill in the knowledge gaps regarding the effects of COVID-19 on people who have lifestyle disorders by studying the variations in exercise routines and the necessary nutrition intake during and after the lockdown. In order to gather information from people with NCDs, the study used a mixed-methods approach that combines a questionnaire survey and focused discussion. The findings highlight the pandemic's early collateral impacts, such as its detrimental effects on physical activity and dietary awareness. The study offers insights into how people with lifestyle disorders alter their exercise regimens, exercise style, and adherence to nutritional diets. The findings show that the pandemic has driven people to change their workout routines, moving away from gyms and outside activities toward alternate at-home techniques. The study also emphasizes the difficulties people encountered in sticking to rigorous nutritional diets during the epidemic because of the restricted availability of fresh and nourishing foods. It further highlights the significance of consistent exercise and mindful eating for those with lifestyle disorders, particularly during times of crisis.

**Keyword:** Covid-19, Diet, Exercise, Health & fitness, Nutrition



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### 1. Introduction

The COVID-19 pandemic has had profound global implications, affecting various aspects of people's lives, including their nutrition and exercise routines (Ammar et al., 2020). The implementation of social distancing measures and widespread lockdowns has disrupted daily activities and led to changes in physical activity levels and dietary habits worldwide. These changes have particularly impacted individuals with lifestyle disorders, such as non-communicable diseases (NCDs), who require specific nutrition and exercise regimens to effectively manage their conditions (Xiao et al., 2020).

Social distancing measures and lockdowns have resulted in limited opportunities for physical activity, such as walking, cycling, or participating in leisure activities, as these activities have been restricted to prevent the spread of the virus (Ammar et al., 2020). This reduction in physical activity levels has the potential to negatively impact the management of lifestyle disorders, as regular exercise plays a crucial role in maintaining physical health and well-being (Lavie et al., 2019).

Moreover, the pandemic and associated lockdowns have had significant psychological effects, including increased levels of anxiety, stress, and depression among individuals (Chtourou et al., 2020). The abrupt changes in daily routines, limited social interactions, and uncertainty surrounding the pandemic have contributed to these psychological challenges, which can further complicate the management of lifestyle disorders (Chtourou et al., 2020).

Individuals with lifestyle disorders face unique challenges during the pandemic, as their exercise routines and access to proper nutrition may be disrupted. Closures of fitness centers, restrictions on outdoor activities, and limited access to fresh and nutritious foods have all contributed to these challenges (Ammar et al., 2020). Adherence to proper nutrition and exercise routines becomes crucial for individuals with lifestyle disorders to maintain their health and manage their conditions effectively.

Understanding the specific impacts of the COVID-19 pandemic on the nutrition and exercise regime of individuals with lifestyle disorders is essential for developing targeted interventions and support systems. By examining the changes in exercise patterns, nutritional habits, and overall well-being of individuals with lifestyle disorders during and after the lockdown, healthcare professionals and policymakers can gain valuable insights to address the challenges they face (Ammar et al., 2020). Hence this study aims to investigate the impact of the COVID-19 pandemic on the nutrition and exercise regime of individuals with lifestyle disorders. By examining the changes in exercise patterns and nutritional intake, this study seeks to contribute to the existing literature and provide evidence-based recommendations for healthcare professionals and policymakers to support individuals with lifestyle disorders during times of crisis.

## **1 Background of the Study**

The COVID-19 pandemic is unprecedented time all across the world. Worldwide, extensive social distancing policies are put into place, restricting people's daily activities and worldwide pleas from governments asking people to stay safe and stay at home. This of course means that most people will spend much of their time (if not all) at home.

These social distancing measures mean that people have far fewer opportunities to be physically active, especially if activities such as walking or cycling as transportation, or taking part in a leisurely activity (e.g. jogging, walking the dog, going to the gym) are being restricted. Furthermore, these drastic measures also make it so much easier to be sedentary at home for long periods of time. The impact of this physical inactivity may very likely be seen in many areas such as health and social care and the mental well-being of people all across the globe.

Although these social distancing measures are important and needed in a time such as now, our bodies and minds still need physical activity and the many benefits thereof.

## **Rationale of the Study**

Since the onset of this disease, people have been confined to their homes, which has not only resulted in various psychological health issues but also challenged their physical fitness and health (Ammar et al., 2020a,b,c,d; Chtourou et al., 2020; Xiao et al., 2020). Although this pandemic situation has led to the unexpected cessation of almost all the outside routine activities of all the individuals, it has profoundly hampered the physical activities of those who necessarily required some or the other sort of physical activities and monitored nutrition regime to keep their lifestyle disorders in check, as gyms, public parks and other such places have been shut down due to the lockdown. However, studies addressing the issues of those populations, who used to spend a significant amount of time for regular workout in order to maintain their physical fitness and health, seem to have found no place so far in the literature in relation to the current pandemic situation. Supposedly, the unique experiences of such people, their health issues, and the ways in which they have dealt with these issues during the COVID-19 pandemic have remained underexplored.

Also, it is well-known that the COVID-19 pandemic has made it difficult for people to adequately maintain their normal physical activity patterns at home (Ammar et al., 2020a). There are plenty of studies that have addressed the impact of COVID-19 on physical activities of the general public (Ammar et al., 2020a,b,c,d; Chtourou et al., 2020; Xiao et al., 2020), demonstrated the significant decrease in physical activities and exercise patterns, and illustrated its ill effects on physical and mental health status. There is also a growing body of literature that suggests strategies to encourage people to be involved in home-based exercises and fitness activities (Ammar et al., 2020a,b,c,d; Chtourou et al., 2020; de Oliveira Neto et al., 2020). However, all these studies were conducted in the earlier phase of the pandemic. There is a lack of studies investigating

the way in which people have dealt with the problems arising from the COVID-19 pandemic and subsequent lockdown/home confinement. In fact, it would be interesting to explore how and to what extent people were able to follow and benefited from the workout at home advice. Therefore, the present research aims at understanding people's unique experiences during the period of lockdown due to COVID-19 and exploring the ways in which regular exercise engagements helped them deal with the psychological and physical consequences of home confinement.

### Literature Review

The COVID-19 pandemic is a massive global health crisis (Bavel et al., 2020) and rapidly spreading pandemic (Bentlage et al., 2020) of recent times. As compared to the earlier pandemics the world has witnessed, the current COVID-19 pandemic is now on the top of the list in terms of worldwide coverage. This is the first time the whole world is affected simultaneously and struck strongly in a very short span of time. Initially, the death rate due to COVID-19 was around 2%, which has now increased to around 4–6% (World Health Organization [WHO], 2020). The statistics does not look so severe, but the total number of cases and the rate at which these cases are increasing day by day make the situation alarming. Exponential growth in COVID-19 cases has led to the isolation of billions of people and worldwide lockdown. COVID-19 has affected the life of nearly each person around the world. The difference between personal or professional lives has narrowed due to work-from-home instructions, and people's lives are revolving around these two due to the lockdown. People have also been pondering over a vital concern at home, i.e., the importance of their health and fitness.

Although imposing lockdown or quarantine for the population has been one of the widely used measures across the world to stop the rapid spread of COVID-19, it has severe consequences too. Recent multinational investigations have shown the negative effect of COVID-19 restrictions on social participation, life satisfaction (Ammar et al., 2020b), mental well-being, psychosocial and emotional disorders as well as on sleep quality (Xiao et al., 2020), and employment status (Ammar et al., 2020d). Announcement of a sudden lockdown of all services and activities, except few essential services, by the authorities has resulted in a radical change in the lifestyle of affected people (Jiménez-Pavón et al., 2020) and has severely impaired their mental health, which has been manifested in the form of increased anxiety, stress, and depression (Chtourou et al., 2020). The sudden changes in people's lifestyle include, but are not limited to, physical activities and exercise. Ammar et al. (2020a) have reported that COVID-19 home confinement has resulted in a decrease in all levels of physical activities and about 28% increase in daily sitting time as well as increase in unhealthy pattern of food consumption. Similar results are also reported by other researchers (Ammar et al., 2020c; de Oliveira Neto et al., 2020) as well. Although these abrupt changes have influenced every individual, many people who were regularly following their fitness activities in gyms, or in the ground, or other places before the lockdown have been affected intensely. Closure of fitness centers and public parks has forced people to stay at home, which has disturbed their daily routines and hampered their fitness activities. While compulsion to stay at home for a long period of time poses a challenge to the continuity of physical fitness, the experience of hampered physical activities, restricted social communication, uncertainty, and helplessness leads to the emergence of psychological and physical health issues (Ammar et al., 2020a,c). Varshney et al. (2020) have found that psychological problems are occurring in adults while adjusting to the current lifestyle in accordance to the fear of contracting the COVID-19 disease. However, effective coping strategies, psychological resources, and regular physical exercise can be helpful in dealing with such health-related problems during the COVID-19 pandemic (Chtourou et al., 2020).

It is important to note that physical activities (PA) and exercise not only maintain physical and psychological health but also help our body to respond to the negative consequences of several diseases such as diabetes, hypertension, cardiovascular diseases, and respiratory diseases (Owen et al., 2010; Lavie et al., 2019; Jiménez-Pavón et al., 2020). In a recent review of 31 published studies, Bentlage et al. (2020) concluded that physical inactivity due to current pandemic restrictions is a major public health issue that is a prominent risk factor for decreased life expectancy and many physical health problems (Jurak et al., 2020). Exercise is shown to keep other physical functions (respiratory, circulatory, muscular, nervous, and skeletal systems) intact and supports other systems (endocrine, digestive, immune, or renal systems) that are important in fighting any known or unknown threat to our body (Lavie et al., 2019; Jiménez-Pavón et al., 2020).

Regular physical activity, while taking other precautions, is also considered effective in dealing with the health outcomes of the COVID-19 pandemic (Chen et al., 2020). Researchers from the University of Virginia Health System (Yan and Spaulding, 2020) suggest that regular exercise might significantly reduce the risk of acute respiratory distress syndrome, which is one of the main causes of death in COVID-19 patients. Exercise and physical activities have important functions for individuals' psychological well-being as well

(Stathi et al., 2002; Lehnert et al., 2012). There is sufficient literature to show that exercise can play a vital role in the promotion of positive mental health and well-being (e.g., Mazyarkin et al., 2019). However, when health promotion activities such as sports and regular gym exercises are not available in this pandemic situation, it is very difficult for individuals to meet the general WHO guidelines (150 min moderate to mild PA or 75 min intensive PA per week or combination of both) (cf. Bentlage et al., 2020). Amidst this pandemic-related restriction (home confinement and closed gyms, parks, and fitness centers), how people cope up and find ways to continue their physical fitness remains an important question.

## 2. Objectives

Objective of the study is to essentially understand the impact of the pandemic on:

- Exercise regime of the population living with some or other sort of lifestyle disorders (non-communicable disease).
- Required nutrition intake to cope with the sedentary lifestyle disorders in day-to-day life during and after the lockdown.

## Research Methodology

The research data was collected by using two methods:

- a) Questionnaire method: Primary data was collected through this method by floating the google form containing the relevant questionnaire.
- b) Focused Group Discussion: A discussion was conducted with 9 respondents categorized into 3 different age groups. The first group consisted of 3 respondents between 25 to 35 years of age, the second group of 3 respondents belonged to the age group of 35 to 60 years while the third group consisted of 3 respondents of the age, above 60. The discussion lasted for around 15-20 mins for each respondent and the questions were asked to understand their health and fitness regime. Also, the questions were posed to understand the impact of Covid-19 on their routine of health and fitness. Nutrition regime was also taken into consideration.

## Data Analysis & Interpretation

### The Analysis of primary data

The data of 107 respondents was collected through a questionnaire. All the respondents were suffering from at least one non-communicable or lifestyle disorder. Out of the total respondents 55.1% of the respondents were diagnosed with the said disease not later than 5 years, while 23.4% of the respondents were suffering from the said disease from 5 to 10 years. 11% of the total respondents were suffering from 10-15 years while there were 12% of the respondents who were suffering from the said disease from more than 15 years.

All the data was categorical, since the study was comparative and descriptive, we have run different t-tests. We have tried to find out the impact of Covid-19 on various health regime of the respondents. The findings are listed below.

#### a) The pandemic affected the nutrition and diet regime of the respondents.

Null Hypotheses – There is no change in the nutrition and diet regime of the respondent's pre and post pandemic.

Alternative Hypothesis – There is a significant change in the nutrition and diet regime of the respondents pre and post pandemic.

Using paired t-test we found the p value is 0.899, which is greater than 0.05, we have significant evidence to accept the null hypothesis and reject the alternative hypothesis. This shows that the pandemic does not have any significant change in the diet and nutrition regime of the respondents.

#### b) The frequency of exercise changed when the pandemic hit.

Null Hypotheses - The pandemic has no change in the exercise regime of the respondents pre and post Covid-19.

Alternative Hypothesis - The pandemic has made a significant change in the exercise regime of the respondents pre and post Covid-19.

Using paired t-test we found the p value is 0.841, which is greater than 0.05, we have significant evidence to accept the null hypothesis and reject the alternative hypothesis. This shows that the pandemic does not have any significant change in the exercise regime of the respondents.

**c) The pandemic forced the respondents to change the mode of their exercise from Gym to any other mode.**

Null Hypotheses - No, the pandemic has not changed the mode of gym for exercise.

Alternative Hypothesis - Yes, the pandemic has made a significant change in the mode of exercise as gym.

Using paired t-test we found the p value is 0.004, which is less than 0.05, we have significant evidence to reject the null hypothesis and accept the alternative hypothesis. This shows that the pandemic has made a significant change in the mode of exercise. Due to the closure of gyms and lockdown, the respondents have shifted to other modes of exercise.

**d) The pandemic forced the respondents to change the mode of their exercise from outdoor games like basketball, tennis or football to any other mode.**

Null Hypotheses - No, the pandemic has not changed the mode of outdoor games like basketball, tennis or football for exercise.

Alternative Hypothesis - Yes, the pandemic has made a significant change in the mode of outdoor games like basketball, tennis or football as exercise.

Using paired-t test we found the p value is 0.001, which is less than 0.05, we have significant evidence to reject the null hypothesis and accept the alternative hypothesis. This shows that the pandemic has made a significant change in the mode of outdoor games like basketball, tennis or football as a form of the exercise regime for the respondents.

**e) The pandemic forced the respondents to change the mode of their exercise from yoga to any other mode.**

Null Hypotheses - No, the pandemic has not changed the mode of exercise from yoga to any other mode.

Alternative Hypothesis - Yes, the pandemic has made a significant change in the mode of exercise from yoga to any other mode.

Using paired-t test we found the p value is 0.023, which is less than 0.05, we have significant evidence to reject the null hypothesis and accept the alternative hypothesis. This shows that the pandemic has made a significant change in the mode of exercise from yoga to any other mode. This shows that people have shifted from yoga to any other mode for their exercise regime.

**f) The health of the respondents improved by following a strict nutritional diet.**

Null Hypotheses - No, the health of the respondents has not improved significantly by following a strict nutritional diet.

Alternative Hypothesis - Yes, the health of the respondents have improved significantly by following a strict nutritional diet.

Using one sample t-test we found the p value is 0.00, which is less than 0.05, we have significant evidence to reject the null hypothesis and accept the alternative hypothesis. This shows that the health of the respondents has improved by following a strict nutritional diet.

**g) The health of the respondents improved by following a strict exercise regime.**

Null Hypotheses - No, the health of the respondents has not improved significantly by following a strict exercise regime.

Alternative Hypothesis - Yes, the health of the respondents has improved significantly by following a strict exercise regime.

Using one sample t-test we found the p value is 0.339, which is greater than 0.05, we have significant evidence to accept the null hypothesis and reject the alternative hypothesis. This shows that the health of the respondents has not shown any significant improvement by following a strict exercise regime.

We have run a non-parametric test to check if respondents have followed walking as a mode of their regular exercise regime. This is because we have found out that the skewness and kurtosis is high. So we have run the Chi-square test for the same.

#### **h) The pandemic forced the respondents to change the mode of their exercise from walking to any other mode.**

Null Hypotheses - No, the pandemic has not changed the mode of their exercise from walking to any other mode.

Alternative Hypothesis - Yes, the pandemic has made a significant change in the mode of their exercise from walking to any other mode.

Using Chi-square test we have found the p value is 0.014, which is less than 0.05, we have significant evidence to reject the null hypothesis and accept the alternative hypothesis. This shows that the pandemic has made a significant change in the mode of their exercise from walking to any other mode.

### **Focus Group Discussion**

The discussion was conducted with 9 respondents categorized into 3 different age groups. The first group consisted of 3 respondents between 25 to 35 years of age, the second group of 3 respondents belonged to the age group of 35 to 60 years while the third group consisted of 3 respondents of the age, above 60. During the discussion it was found that members from age group 25-35 years and 35-60 years had exercise regimes like going to gym, playing outdoor games which was completely stopped during pandemic. 2 members regularly went for walks and that too was stopped. This affected their health and their NCDs saw a big increase which led to increase in dosage of medicine. Also, post pandemic many lost the nutrition diet. They shared that since they were working from home, it led to haphazard eating timing and also skipped meals at times. One of the respondents in the category 35-60 years managed to have continuous exercise at home and walks on terrace along with breathing exercises and has maintained normal diet which helped him to reduce the medicine in take when compare to pre pandemic. The respondents from category of above 60 years generally had walking as their main form of exercise which was stopped due to pandemic for a very long period of time as they were most vulnerable to the pandemic. This led to irregular eating habits and had an impact on required nutrition. They shared that their sugar levels had gone up and BP also was impacted.

### **3. Conclusion**

Increasingly, From the study it could be understood that staying healthy is at the top of nearly everyone's priority list, and our daily choices can determine just how healthy we are. Not everything is in our control, but the habits and approaches we take to our health can often make a difference between being healthy and unhealthy. Two areas we have the most control over is:

- Our Diet; and
- Exercise

These can both have huge effects on overall health, and can be some of the main factors in preventing disease and other complications later in life. Although social distancing and shielding are thought to impact an individual's physical activity and sedentary behaviour levels there are conflicting reports about the magnitude and direction of this impact. It is thought that some individuals may have more time for structured exercise, however, their sedentary time may have increased due to working from home and having lost the daily physical activity associated with personal transport and incidental physical activity associated with their usual working environment and practices. Likewise, for nutrition people enjoyed the consumption of packed foods during the initial unavailability of fresh food and lockdowns combined. However, as the bell curve of the impact and severity of the pandemic started changing, people started understanding the gravity of the situation and the vital importance of consuming nutritious food as a preventive healthcare measure.

### **Implications**

From the study it could be implied that following a routine exercise regime and being conscious towards one's nutritional intake are two vital cogs in the machinery called life and neither one of it can be either ignored or overlooked to lead a healthy and self-sufficient life.

A regular exercise routine is essential irrespective of how busy someone is, how important deliverable is on the table or how badly someone is tired from the previous day and in turn wants to oversleep on the weekends. Even the lack of availability of operational fitness centres and gyms during a crisis or pandemic should not become a reason for our inability to exercise.

Following a strict nutrition regime is imperative for staying healthy even in the times when fresh fruits and vegetables are not readily available due to lockdown or break-down in the supply chain. And it definitely can be achieved if we stay a little vigilant about our food intake and the potential consequences it might have on our health.

### Conclusion

This study provides evidence of immediate collateral consequences of the COVID-19 outbreak, demonstrating its adverse impact on the physical activity and nutritional consciousness of people from all walks of life. These findings can guide efforts to preserve and promote the importance of physical activities in form of regular exercises and following a strict nutrition regime during the crisis recovery period, and to inform strategies to mitigate potential harm during future pandemics.

**Ethics approval:** Sumatera Medical Journal (SUMEJ) is a peer-reviewed electronic international journal. This statement below clarifies ethical behavior of all parties involved in the act of publishing an article in Sumatera Medical Journal (SUMEJ), including the authors, the chief editor, the Editorial Board, the peer-reviewer and the publisher (TALENTA Publisher Universitas Sumatera Utara). This statement is based on COPE's Best Practice Guidelines for Journal Editors.

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