



Nutrition, physical activity and psychological status during lockdown due to covid-19

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ABSTRACT. Aim of the present study was to assess physical activity, nutrition and psychological status of the population during lockdown due to covid-19. Online survey was conducted among 534 participants within the age range of 16-78 years using convenient sampling. Participants from varied regions within India and abroad were enrolled for the present study. Volunteered participants were solicited to take part in a survey that has to be carried out by filling an online questionnaire form available to them as a URL link in the invitation through WhatsApp/Messenger. The gathered data has been compiled, coded and cleaned using Microsoft Excel. Analysis has been carried out employing descriptive and inferential statistics in SPSS 17.0. Majority of participants in the studied population showed significant change in their nutrition and physical activity status due to lockdown. Covid-19 lockdown did limit their daily activities. It also had impacted their psychological status. The current investigation accentuates the need to pursue suitable life style for the maintenance of optimum metabolism and physiology. Sticking to more regular timetable of meals, effective management of stress levels and continued physical activity during the quarantine and in all the following phases of living is desirable.

Keywords: covid-19; physical activity; nutrition; lockdown; health; behavioral changes.

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Introduction

The outbreak novel Coronavirus disease 2019 (covid-19) was declared as a pandemic by the World Health Organization (WHO) in March 2020 and is affecting a large number of people across 198 geographical regions (Li et al., 2020). Ever since the outbreak, covid-19 has started to spread rapidly and as there is no vaccine for its treatment, government authorities has implemented several protective measures like lockdown, social distancing, isolation, etc, to contain the spread of virus in many countries. However, the lockdown imposed during this crisis, as preventive measure, is affecting many individuals both physically and mentally (World Health Organization [WHO], 2020a, 2020b) and as reported is generating widespread emotional distress, insecurity and confusion, throughout the population (Liu et al., 2020; Dong & Bouey, 2020). Total shutdown of leisure venues viz., parks, recreational squares, gyms and fitness centers (Pfefferbaum & North, 2020) present major challenges in maintaining active lifestyle. The current nationwide lockdown in our country have also been reported to limit exercise or any form of physical activity but these actions were predicted to have significant negative impact on physical activity pattern globally (Alwan et al., 2020).

Prolonged periods of social distancing and confinement might be associated with sedentary behavior including physical inactivity, reclining and high screen time. Excessive time spent in screen based electronic media such as watching television (TV) have detrimental impact on physical health, sleep pattern, quality of life. Whereas, particularly during this coronavirus pandemic, adopting a healthy and active lifestyle, maintaining regular exercise are a must in a safe home environment (Hammami, Harrabi, Mohr, & Krustup, 2020). WHO (2020b) have made an advisory that wherever possible, one can perform simple daily exercise at home including, cleaning household chores, online exercise training, stair climbing, walking in the house,

skipping ropes, etc, during quarantine or isolation period. Physical activity and exercise not only improves cardiovascular fitness (Chen et al., 2020b) but also has beneficial and positive effect on physiological health parameters and wellbeing too (Lin et al., 2015). Besides physical health, social distancing in this emergency health situation can take toll on one's mental health in the population too (Chekroud et al., 2018). Mass shut down of the daily activities, school and colleges, work places, bans on cultural and social events, travel restrictions (Bao, Sun, Meng, Shi, & Lu, 2020) could affect our mental health now and in the future. In addition to the fear of contracting the infection, uncertainty of future, financial insecurity and unemployment will inevitably cause serious psychological distress (Parnell, Widdop, Bond, & Wilson, 2020). A pandemic like this condition has caused fear, anxiety, sleep disturbances, panic attacks, stigma and avoidance of contact, and disruption among the general public (Holmes et al., 2020).

Nutrition is a critical determinant of the immune responses. So, during a pandemic like this, it is extremely important for all of us to maintain healthy eating lifestyle and healthy diet to boost the immune system. Although there are no direct evidence or data on the effects of dietary supplements on severity of covid-19, some data supports that maintaining a healthy diet can help improve the immune system, reduce risk of some viral infections and disease susceptibility (Brooks et al, 2020). According to Turkey Dietary Guidelines (Naja&Hamadeh, 2020), healthy diet, comprising of nutrient-rich vegetables, whole grain products and fruits, high-protein, dairy products (curds, milk, cheese) and adequate amount of water intake is recommended. Diet predominantly deficient in protein and micronutrients is associated with increased susceptibility to infection, so adequate amount of diet with sufficient protein are recommended to boost immune function (Turkish Dietetic Association [TDA], 2020). Although, whether vitamin C supplements can be used to prevent covid-19 infection were inconclusive or negative (Hauge et al, 2007), some evidence demonstrated beneficial effect of vitamin C to prevent common cold and can reduce risk or severity and support respiratory defense mechanisms. Work from home instructions and need, also is a matter of concern, as it involves long hours of sitting, internet non-availability causing frustration and irritability. This is especially among those who are alone at home or are with young children demanding their attention as schools are closed and nannies are not allowed. Taking consideration of all these factors, this study was thought of, conceptualized and executed online.

Methodology

Keeping in mind the objective of the study, questionnaire was made and tested on few participants. Some changes were made in the final questionnaire and the same was sent using WhatsApp/Messenger. A convenient sample of 534 participants has been recorded; from a non-probability sampling format. These participants belonged to the age group of 16-78 years, from varied regions within India and even outside the national boundaries, who were also potential internet-users; equally affected by the consequences of lockdown (Figure 1). For this study participants were solicited to take part in a survey that has to be carried out by filling an online questionnaire form available to them as a URL link in the invitation. Those who volunteered for this study were further asked to circulate the link among the groups who were willing to voluntarily participate in the survey.

The form included 58-items in all; that was divided into four sections. Stripping all personal information, only general socio-demographic data (age, gender, marital status, education, occupation, income, members in family) were obtained in Section 1 of the form. Section 2 assessed the level of physical activity among the participants specifically during the course of this lockdown period. Section 3 incorporated questions to evaluate the psychological state of participants with respect to the current prevailing conditions due to covid-19. Finally, section 4 made an attempt to review the nutritional habits/behavior of people being followed during the time of lockdown due to the pandemic. Questions comprised of closed-ended, multiple-choice type requiring one or more option/s to be chosen; while few were open-ended, short answer-type. Questions and options (if offered) were contextually framed with concise-wording, taking care of unambiguity and understandability. Pilot survey, prior to the main study survey, has been conducted to verify each and every word, statement, question, question-sequence and answer categories for if they were correctly laid-out, relevant and in appropriate format. Number and content of questions to be included in the survey has been decided carefully to confirm least time to be spent and clarity upon filling it to ensure higher response rates. Order of questions and answers were confirmed and reconfirmed for logical sequencing of the survey-items.

The online-survey questionnaire opened with providing relevant details of the study along with necessary instructions for filling it. Participation in the study was completely voluntary, taking care of retaining the

privacy and confidentiality of participants, and proceeded further only with their consent. The survey was designed and dispensed online between 19 April, 2020 and 3 May, 2020. Average duration of survey-completion was 15 minutes. Data collected through the synchronous web-based survey has enabled a speedy distribution and response pace, preventing direct social contact with participants, ensuring the very guidelines of this lockdown.

Data gathered has been compiled, coded and cleaned using Microsoft Excel. Analysis has been carried out employing descriptive and inferential statistics in SPSS 17.0.

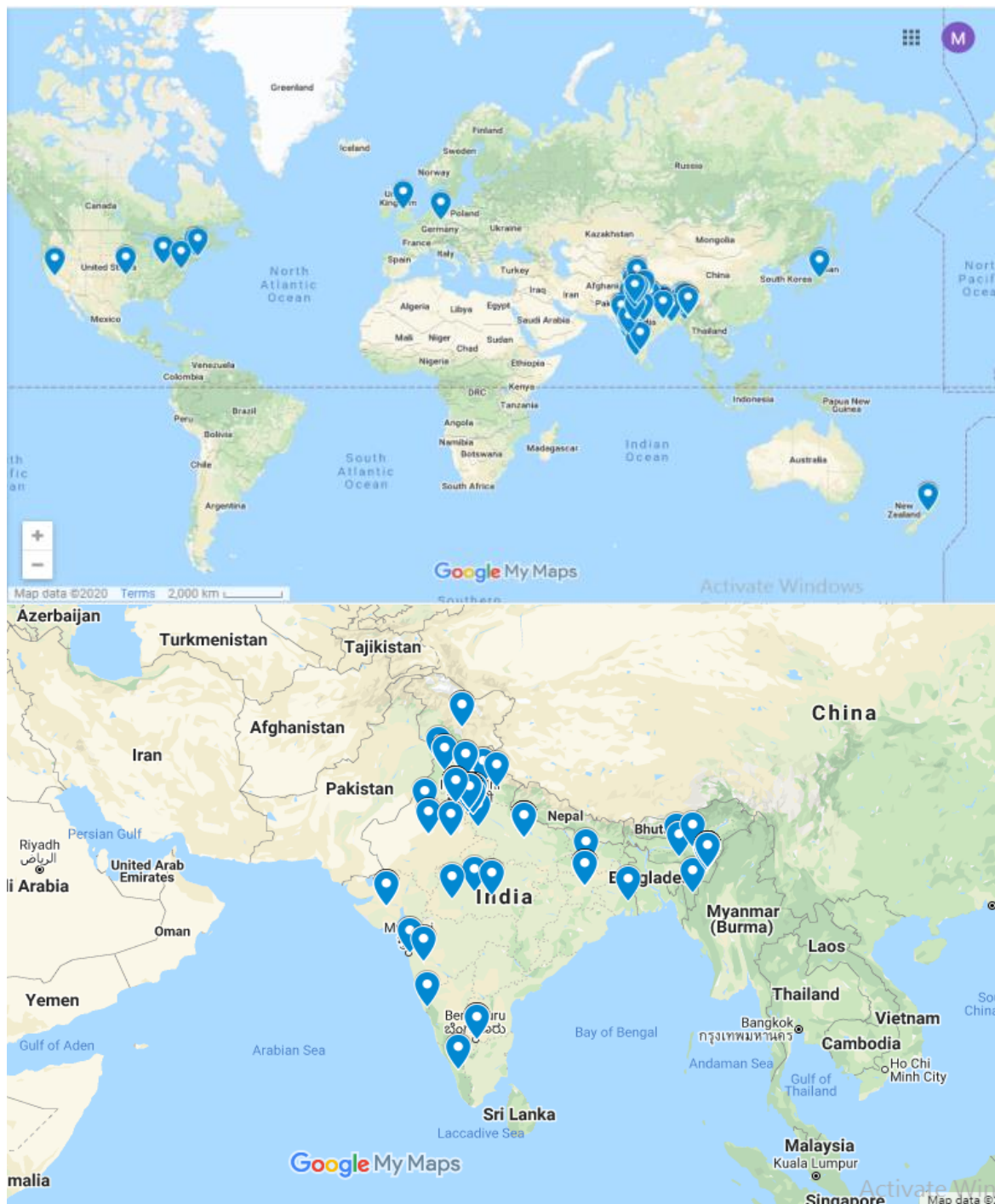


Figure 1. Geographical distribution of the participants worldwide & India.

Table 1 displays the percentage distribution of participants. It was found that 62.7 % of the participants were females and 36.5 % males. There were 0.7% of the participants who wished not to disclose their gender. Minimum education of all the participants are intermediate or above. More than 50 % of respondents had monthly income of 50,000 or above.

Table 1. Distribution of the participants according to gender.

Gender	Frequency	Percent (%)
Male	195	36.5
Female	335	62.7
Prefer not to say	4	.7
Total	534	100.0

Results

Results for the present study have been described in three subheadings: dietary habits, physical activity trend and psychological health status.

Dietary pattern /nutrition

In the present study change in meal timing, type of diet, food supplement intake, water intake and other related food habits were studied. It was found that 71.7% of the respondents reported a change in their food habit due to the lockdown (Figure 2a). Change in meal time was also reported by 69.7 % of the participants. It was found that 63.9% of the participants consumed vegetarian food while 36.1% consumed non vegetarian. It was found that 96.8 % of the participants did not order food from outside while only 3.2 % ordered food from outside.

Figure 2a displays the percentage distribution of participants as per change in food habits during lockdown. It was found that 71.7 % of the participants reported change in their food habits due to the lockdown whereas 28.3 % do not report any change in food habits. Figure 2b displays the percentage distribution of participants according to vitamin C supplements intake in diet. It was found that 86.9 % of the participants included vitamin C in their diet whereas 13.1 % did not. It was found that 47.6% of the participants consumed fruit daily in their diet. While 10.9% each consumed 4-5 times in week and thrice in a week respectively. About 7.5% of the participants did not consume fruits at all. Raw vegetable/salad were consumed daily by 39.5% of the participants and 15.2% of the participants did not consume raw vegetable/salad at all.

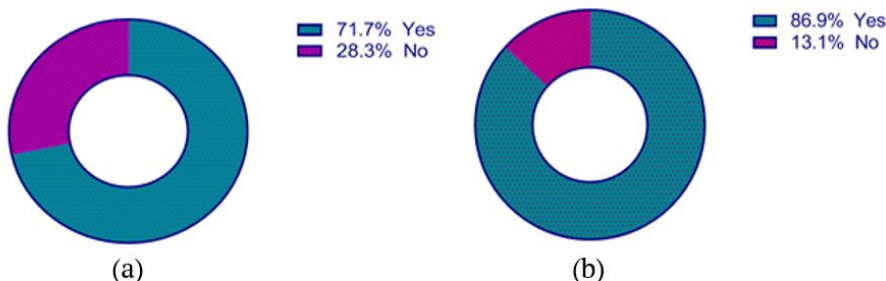


Figure 2. (a) Distribution of participants as per change in food habits during lockdown; (b) Distribution of participants as per vitamin C supplement in diet.

Figure 3 displays the percentage distribution of participants according to amount of water intake per day. It was found the 29.6% of the participants had an intake of water which is 5-6 glasses per day followed by 28.1% with an intake of 7-8 glasses of water per day and 25.5% of the participants had an intake of more than 8 glasses of water in a day. The least percentage of participants (16.9%) had an intake of less than or equal to 4 glasses in a day.

Water intake per day

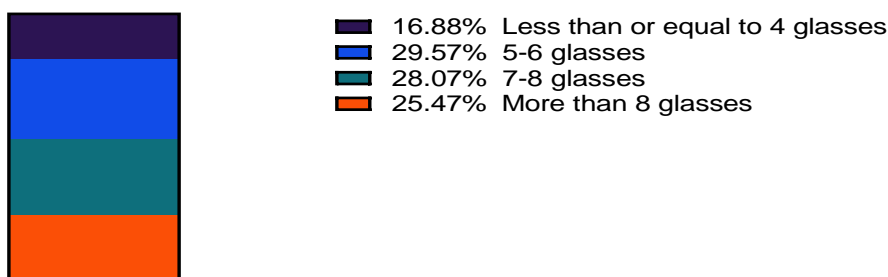


Figure 3. Distribution of participants according to amount of water intake per day.

Table 2 displays the percentage distribution of participants according to change in dietary habits during lockdown. It was found that 26% of the participants observed an increase in eating frequency of food and 12.4% observed reduced eating frequency while 26% were found to have no difference at all. It was also found that 14.4% of the participants observed increase in portion size, 13.8% observed lessening of portion size. But there were some participants (18.7%) who are not sure. It was found that 60.9% of the participants preferred simple food, 32% preferred healthy food and 7.1% preferred fried/junk food.

Table 2. Distribution of participants according to change in dietary habits during lockdown.

Change in dietary habits during lockdown	Yes		No	
	N	%	N	%
Increase in portion size	73	14.4	434	85.6
Lessening of portion size	70	13.8	437	86.2
Increased eating frequency	132	26.0	375	74.0
Reduced eating frequency	63	12.4	444	87.6
No difference	132	26.0	375	74.0
Cannot say/not sure	95	18.7	412	81.3
Others	10	2.0	497	98.0

Physical activity trends

Knowledge about the term covid-19 and the etiology of the disease was found among 96.3% of the participants. It was found that 82% of the participants agreed that covid-19 lockdown has limited their daily physical activity levels. The reasons for limited physical activity were also studied among the participants which are displayed as below:

Table 3 displays the percentage distribution of participants according to reason which were restricting them from taking part in sports/exercise/physical activity during the lockdown. It was found that 56.4% of the participants blamed the current nationwide lockdown as the reason for stopping them to take part in sports/exercise/physical activity. It was found that 19.5% responded that they are not able to continue their sports/exercise/physical activity due to the closure of gyms. While 20.9 % reported that lack of space deterred them from taking part in sports/exercise/physical activity and 24.5 % of the participants were too busy with other work and did not have time for sports/exercise/physical activity. It was further found that 13.6 % of the respondents were not interested in any sports/exercise/physical activity. While collecting data on distribution of participants according to type of exercise performed, it was found that 29.6% of the participants performed yoga during this time of lockdown and 22.1% performed dance/zumba/aerobics. It was also found that 17.9% of the participants managed to do jogging/running/skipping-rope during the current lockdown and 22.1% did brisk walking/cycling in their own compound. While, 26.4% of participants were not involved with any type of physical activity during lockdown.

Table 3. Reasons for limited physical activity during lockdown.

Reason	Yes		No	
	N	%	N	%
Current National Lockdown (due to covid-19)	286	56.4	221	43.6
Fitness gyms are closed	99	19.5	408	80.5
Not interested in any sport/exercise/physical activity	69	13.6	438	86.4
Lack of space for doing any form of exercise	106	20.9	401	79.1
Lack of time/too busy with other work	124	24.5	383	75.5
Others	35	6.9	472	93.1

Figure 4 displays the percentage distribution of participants according to task taken up to avoid being sedentary during the current lockdown. It was found that 69.2% of the participants did household chores, 39.1% stood often/ did walking to avoid being sedentary. It was also found that 23.9% of the participants follow online exercise/ dance classes and 10.8% of the participants were reported not to indulge in any form of activity.

It has been observed that there are varied worries and concern like 58.4% of the participants were concerned that they might gain weight due to physical inactivity during the current lockdown, 22.5 % were worried as they were not able to perform exercise. But 19.1% were not worried as they were not interested in any kind of exercise or physical activity. It was also found that 30% of the participants performed daily indoor

physical activity (PA) during this lockdown period. It was followed by 23.2 % of the participants who perform indoor PA rarely, 17.6% performed indoor PA 3-4 times in a week. It was found that 8.8% of the participants did not perform indoor PA at all during this lockdown period.



Figure 4. Distribution of participants according to task taken up to avoid being sedentary.

Figure 5 displays the percentage distribution of participants according to time spent on Physical Activity (PA) weekly. It was found that 71.7% of the participants spent less than or equal to 6 hours weekly on PA, 17% of the participants responded that they do not perform PA on a weekly basis and 11.2% of the participants spent more than or equal to 7 hours weekly on PA.

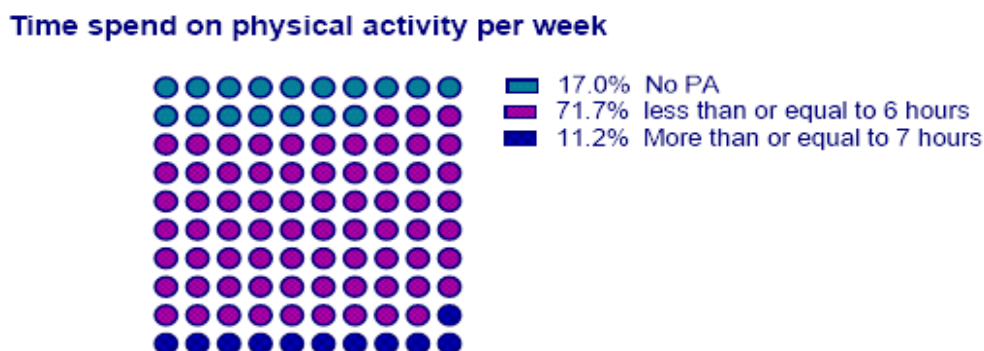


Figure 5. Distribution of participants according to time spent on Physical Activity (PA) per week.

Table 4 displays percentage distribution of participants according to screen time per day. It was found that 28.3% of the participants spent 3.4 hours screen time in a day, followed by 27.7% of the participants who spent more than 6 hours screen time in a day. The least screen time spent by the participants (6.7%) was less than 1 hour. An increase in television watching time was reported by 69.7% of the participants due to the current lockdown.

Table 4. Distribution of participants according to screen time per day.

Screen time per day	Frequency	Percent (%)
Less than 1 hour	36	6.7
1-2 hour	93	17.4
3-4 hour	151	28.3
5-6 hour	106	19.9
More than 6 hour	148	27.7
Total	534	100.0

Psychological/mental health status

Table 5 displays the percentage distribution of participants according to current state of mind with respect to Corona virus. It was found that 47.5% of the participants felt tensed and anxious followed by 34.1% of the

participants who felt frustrated due to the lockdown. It was found that 26.2% of the respondents were even scared but 21.5% of the participants felt relaxed as they do not have to go to college/work and simply stay comfortably at home. 17.4 % of the participants were unaffected due the pandemic.

Table 5. Distribution of participants according to current state of mind regarding corona virus.

Current state of mind with respect to Coronavirus	Yes		No	
	N	%	N	%
Tensed and Anxious	241	47.5	266	52.5
Scared	133	26.2	374	73.8
Angry	47	9.3	460	90.7
Frustrated	173	34.1	334	65.9
Relaxed	109	21.5	398	78.5
Happy	41	8.1	466	91.9
Unaffected	88	17.4	419	82.6
Other	11	2.2	496	97.8

Figure 6 displays the percentage distribution of participants according to the main cause of concern during the lockdown. It was found that 62.5% of the participants had a general concern for the community as a whole while 50.7 % were scared for themselves and their near dear ones. 36.9% were concerned that they were not able to see/visit friends and relatives and 33.9% were concerned as they were not able to hang-out and do leisure time activities that I usually did. There were some participants (32.1%) who were having tension concerning availability of food/essential items etc. Only 4.9% of the participants were concerned as they are not able to pay debts/E.M.I.

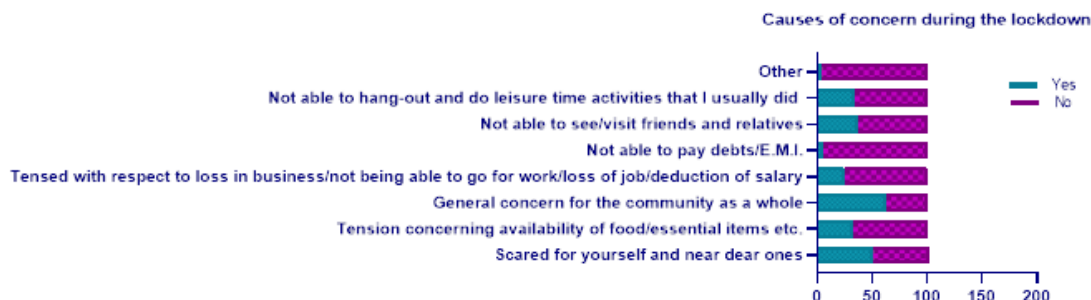


Figure 6. Distribution of participants according to causes of concern during the lockdown.

Table 6 displays the percentage distribution of participants according to self observed behavioral changes during this lockdown due to novel corona virus. It was found that 36.5% of the participants noticed that they had mood swings during the lockdown and 35.1% got irritated easily. While 28.6% of the participants felt stronger mentally due to the lockdown, 15.2% felt weak and vulnerable due to the fear of Corona virus. There were 5.9% of the participants who felt no change and a negligible percentage of participants (1%) who had increased alcohol consumption/smoking/tobacco use. It was observed that 50.2 % of the participants responded that lockdown have made them become more closer to their family while 36.1% responded that they do not feel the effect on their family ties. While, 12% of the participants felt that lockdown have made them lose their patience easily and get irritated with their family members.

Table 6. Distribution of participants according to behavioral changes during lockdown.

What behavioral changes have you observed in yourself during this lockdown due to novel Coronavirus?	Yes		No	
	N	%	N	%
get irritated easily	178	35.1	329	64.9
get upset easily	112	22.1	395	77.9
experiencing mood swings	185	36.5	322	63.5
have become argumentative	77	15.2	430	84.8
feeling strong mentally	145	28.6	362	71.4
increased alcohol consumption /smoking/ tobacco use	05	1.0	502	99.9
I feel weak and vulnerable	77	15.2	430	84.8
No change	30	5.9	477	94.1
Other	38	7.5	469	92.5

According to the distribution of participants of how Coronavirus has affected their daily routine, it was found that 84.1% of the participants felt that corona virus has affected their daily routine whereas 15.9% participants felt that there was no effect in their daily routine due to the novel Coronavirus. 39.1% of the participants felt that lockdown did not have effect on their work and no fear of losing their job and they are getting their salary despite the lockdown. 35.8% were found to be working from home. It was found that 4.1% of the participants lost their jobs or were afraid that they might lose their jobs shortly if the lockdown continues. It was also found that 4.3% of the participants have not received their salary due to the current lockdown.

Figure 7 displays the percentage distribution of participants according to influence of lockdown on sleep pattern. It was found that 47.4% of participants reported increase in the duration of sleep due to the lockdown while 17.4% of the participants reported decreased duration of sleep. It was also found that 35.2% of the participants reported no change in the sleep duration.

Influence of lockdown on sleep pattern

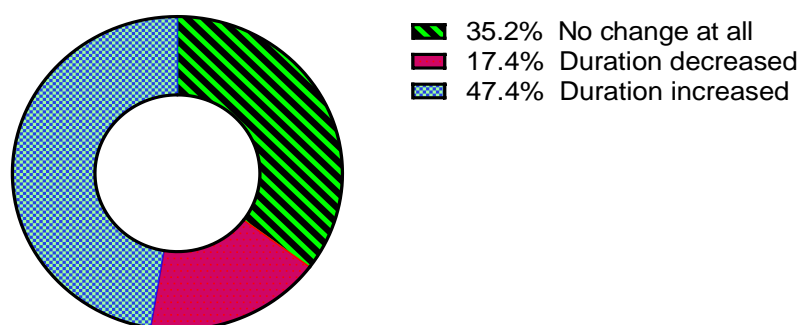


Figure 7. Distribution of participants according to influence of lockdown on sleep pattern.

Table 7 displays the association of daily physical activity levels with sleep pattern and food habits. It was found that the association of daily physical activity levels with sleep pattern and food habits were found to be statistically significant at $p < 0.001$.

Table 7. Association of daily physical activity levels with sleep pattern and food habits.

	Covid-19 lockdown and physical activity level		Chi square	
	Yes	No		
Influence on sleep pattern	No change at all	136	52	18.5***
	Duration decreased	82	11	
	Duration increased	220	33	
Change in food habits	Yes	329	54	13.8***
	No	109	42	

*** $p < 0.001$.

Discussion

The coronavirus disease 2019 (covid-19) pandemic is found to have a profound effect on all aspects of society, including mental and physical health of an individual. Covid-19 as a worldwide pandemic has imposed a new set of challenges for the individual(s). In the present study a general awareness of covid-19 was found among most of the respondents. Respondents in the present study have added more fruits which are especially rich in vitamin C, green vegetables, salads, good amount of water and milk in their meals to stay healthy and also to boost their immunity level. They have resorted to simple and healthy food. Changes in meal timings, increased meal frequency and increased portion size of each meal were reported. Most of the nutrition and dietary recommendations to combat viral infections, including covid-19, lies within the link between diet and immunity. Diet has a profound effect on people’s immune system and disease susceptibility. Dietary ingredients are significant determinants of gut microbial composition and consequently can shape the characteristics of immune responses in the body (Kalantar-Zadeh & Moore, 2020). Nutritional deficiencies of energy, protein, and specific micronutrients are associated with depressed immune function and increased susceptibility to infection. An adequate intake of iron, zinc, and vitamins A, E, B₆, and B₁₂ is predominantly vital for the maintenance of immune function (Chen et al., 2020a).

Most of the participants conveyed that the lockdown has influenced their physical activity level due to lack of space and lack of time for physical activity, increased household chores, extra cleaning drive. However, a significant percentage of respondents were found to be involved in physical activity of about 6 hours or less per week. Yoga, followed by aerobics, dance, cycling, skipping, jogging and indoor gymming were reported to be the major physical activity followed by the respondents. Most of the respondents were participating in the household chores. Many of the respondent reported that their TV watching time has increased and it was more than 3 hours per day during the lockdown. Adequate level of physical activity should be maintained throughout adulthood in order to reduce the risk of chronic disease and should be continued into old age to counteract the age related losses in muscle and bone, deterioration of the cardiovascular system and to decrease the risk of osteoporotic fractures.

In the present study, sizable percentage of the respondent reported to be getting closer to their family members during the current lockdown. At the same time a majority of the respondentsorted themselves to be tensed and anxious, frustrated and scared due the pandemic. Major reasons for such feelings were their concern for their near and dear ones, availability of food, loss of their business/work/jobs, no socialization with friends and relatives, etc. Behavioral changes among the respondents were irritation, mood swings and getting upset easily. However, many were feeling mentally strong as well. Pandemic outbreak have negative effects on physical and psychological health of individuals and society (Gleeson, Nieman, & Pedersen, 2004; Wypych, Marsland, & Ubags, 2020) for instance, psychological issues, mental distress, grief and bereavement, stress, anxiety, depression, loneliness, mood problems, sleep problems, worry, denial, boredom, frustration, etc.

In the present study significant association of physical activity with sleep pattern and food habits was reported. There are direct relationships between nutrition, stress susceptibility, mental health and mental function throughout the lifespan (Banerjee, 2020; Kang et al., 2020). Our study highlighted the importance of paying attention to nutrition, physical activity and psychological health at individual level. It also suggested a need for more awareness generation, proper guidelines for people sitting at home during the lockdown so that they can take care of themselves, their family and community in a better way. Stretches of lockdown during the epidemic that imposed many restrictions on the public turned out into poorer dietary compliance, longer screen time, irregular sleep patterns; thus limiting the routine physical activity (Sankar, Ahmed, Koshy, Jacob, & Sasidharan, 2020; Verma, Rajput, Verma, Balania, & Jangra, 2020). Impairing dietary patterns in addition to increased carbohydrate intake, downfall in sufficient levels of exercise and physical activity, and widespread mental stress was a commonly witnessed phenomenon among the non-diabetics. The event consequently hints toward a much higher disruption of an optimum metabolism during the lockdown (Ghosh, Arora, Gupta, Anoop, & Misra, 2020) causing a higher risk for patients of diabetes and hypertension, also suffering with higher weight gains. Verma et. al. (2020) has proven the premise in their study that has demonstrated a negative impact of lockdown on glycemic control leading to higher average blood glucose during the lockdown phase. This has been further confirmed, clinically, by considering the HbA1c count in the pre-lockdown and lockdown period that is indicative of average glucose levels over a prolonged period of three months. Here they have reported a highly significant difference between the two phases (Verma et al., 2020). Ghosal, Sinha, Majumder, and Misra (2020a) have also concluded that the duration of lockdown (in covid-19) is directly proportional to the worsening of glycaemic monitoring and control, giving rise to diabetes-related complications.

Loss of continuum of care along with improper lifestyle was expected to worsen lipidemic, glycemic and blood pressure control in people (Ghosal et al., 2020b). However, the study carried out by Sankar et al. (2020) did not talk of any significant overall change in the HbA1c and body weight during the lockdown time, where they have considered predominantly semi-urban and rural population. It is highly presumed that the overall increase in the healthy diet pattern and increased involvement in household chores could have helped in preventing significant HbA1c and body weight change in majority of the studied population, than the counterparts (Chen et al., 2020a, 2020b). An important finding of concern is the physical inactivity and unhealthy food pattern being more predominant in the younger generation, and this trend also applied to those who missed their medications during the lockdown period (Chen et al., 2020a, 2020b).

Watching television, getting engaged with household chores or spending ample time with family might have helped majority of people to overcome their stress and anxiety levels during these hard times (Sankar et al., 2020). Yet the unhealthy food pattern prevailed among those with increased mental stress and poor sleep (Sankar et al., 2020). Anxiety regarding the spread of the pandemic had a significant impact on sleep quality, which was

more in females and elderly as suggested by Sankar et al. (2020). As high as 87% of people with diabetes, were reported in a study, to be affected by psychological stress while 27% experienced sleep deprivation during these lockdown and quarantine period (Ghosh et al., 2020). This is chief reason for a higher blood pressure and pulse rate count.

A disrupted daily life routine due to anxiety, worry, isolation, greater family- and work-related stress and/or excessive screen time results into a compromised sleep, health and well-being (Sankar et al., 2020). A marked decrease in physical activity and increased intake of carbohydrates and snacking, they all bring about gain in weight and destabilizing metabolism (Sankar et al., 2020). Investigation led by Pal, Yadav, Verma, and Bhadada (2020) has revealed a reduction in physical activity by 90% while 72% of the participants complained of high glucose recordings since the commencement of lockdown. A 5 kg weight gain from baseline could result in a 27% increased risk of developing diabetes (Misra et al., 2018). Weight gain holds a paramount importance in regulating the functioning of metabolic system and bodily implications that has risen even more in the current era). Obesity increases the risk of hyperglycemia, hypertension and dyslipidemia (Ghosal et al., 2020b). Association of co-morbidities with critical outcomes in covid-19 patients is, therefore, of an immense meaning (Ghosal et al., 2020a). It increases the mortality risk from covid-19, furthermore (Ghosal et al., 2020b).

Monitoring and management of chronic lifestyle-relating health concerns, as per expectations, had taken a backseat during this pandemic-time (Pal et al., 2020). The ongoing conditions and the prevailing lockdown alteration in routine diet, limitation of physical activity, restricted availability of medications, lack of follow-ups and constant stress and anxiety (Banerjee, Chakraborty, & Pal, 2020). This is particularly important for India because Asian Indians have a heightened propensity to develop diabetes (Ghosal et al., 2020b) as well as other obesity associating morbid conditions. At this point, it is important to point out here that, had it been a larger sample size of the study, in terms of participants responding from outside India, it would have enabled to talk of the results of the investigation in a more generalized way. Since it is a very rare event when the whole world is exposed to a condition to which we are together encountering it. Recording the complications and consequences arising out of a distorted lifestyle pattern could be attempted employing a homogenized set of questions so as to understand the actual status of the society in terms of non-communicable implications during these unusual times. Final limitation of the work is related to the self reporting aspect of the study by participants upon the grounds of which the accuracy of the results is readily challengeable and dubious.

Conclusion

During this unprecedented time of a global health crisis, when every domain of human living and survival has got upended, it becomes a personal duty of each one of us to care for one-another, especially the most vulnerable among us. Food and nourishment which is the backbone of an active immunity, needs particular consideration in the current times. In an individual level, one must follow the hygiene of washing our hands for at least 20 seconds as often as possible, clean all surfaces in the house and wash eatables properly before use. One's daily diet must include lots of vegetables and citrus fruits along with plenty of liquid intake to maintain resistance of body towards all forms of contagion. In today's times when body movement and outdoor activity levels have dramatically dropped it gets immensely important to manage keeping up an optimum degree of physical activity in some form. Physical activity is not only significant for achieving the essential physiological balance rather it also plays crucial role in enhancing and lifting up mood, psychosocial alertness and increase wellbeing. We must altogether join hands during this most crucial moment to face and fight against covid-19 by staying informed and updated with every upcoming lead on it, and acting accordingly. The present study highlighted the importance of paying attention to nutrition, physical activity and psychological health at individual level. It also suggested a need for more awareness generation, proper guidelines for people sitting at home during the lockdown so that they can take care of themselves, their family and community in a better way.

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References

- Banerjee. D. (2020). The covid-19 outbreak: crucial role the psychiatrists can play. *Asian Journal of Psychiatry*, 50(1), 1-2. DOI: <https://doi.org/10.1016/j.ajp.2020.102014>.
- Banerjee M., Chakraborty, S., & Pal, R., (2020). Diabetes self-management amid covid-19 pandemic. *Diabetes & Metabolic Syndrome*, 14(4), 351-354. DOI: <https://doi.org/10.1016/j.dsx.2020.04.013>
- Bao, Y. Sun, Y., Meng, S., Shi, J., & Lu, L. (2020). 2019-CoV epidemic: address mental health care to empower society. *The Lancet*, 395(10224), E37-E38. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30309-3](https://doi.org/10.1016/S0140-6736(20)30309-3)
- Brooks, S. K., Webster, R. K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence *The Lancet*, 395(10227), P912-P920. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8)
- Chekroud, S. R., Gueorguieva, R., Zheutlin, A. B., Paulus, M., Krumholz, H. M., Krystal, J. H., ... Chekroud, A. M. (2018). Association between physical exercise and mental health in 1· 2 million individuals in the USA between 2011 and 2015: a cross-sectional study. *The Lancet Psychiatry*, 5(9), P739-P746. DOI: [https://doi.org/10.1016/S2215-0366\(18\)30227-X](https://doi.org/10.1016/S2215-0366(18)30227-X)
- Chen, J., Wu, J., Kong, D., Yang, C., Yu, H., Pan, Q., ... Liu, H. (2020a). The effect of antioxidant vitamins on patients with diabetes and albuminuria: a meta-analysis of randomized controlled trials. *Journal of Renal Nutrition*, 30(2), 101-110. DOI: <https://doi.org/10.1053/j.jrn.2019.06.011>
- Chen, P., Mao, L., Nassis, G., Harmer, P., Ainsworth, B., & Li, F. (2020b). Coronavirus disease (covid-19): the need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science*, 9(2), 103-104. DOI: <https://doi.org/10.1016/j.jshs.2020.02.001>
- Dong, L., Bouey, J. (2020). Public mental health crisis during covid-19 pandemic, China. *Emerging Infectious Diseases*, 26(7), 1616-1618. DOI: <https://doi.org/10.3201/eid2607.200407>.
- Ghosal, S., Sinha, B., Majumder, M., & Misra, A. (2020a). Estimation of effects of nationwide lockdown for containing coronavirus infection on worsening of glycosylated haemoglobin and increase in diabetes-related complications: a simulation model using multivariate regression analysis. *Diabetes & Metabolic Syndrome*, 14(4), 319-323. DOI: <https://doi.org/10.1016/j.dsx.2020.03.014>
- Ghosal, S., Arora, B., Dutta, K., Ghosh, A., Sinha, B., & Misra, (2020 b). Increase in the risk of type 2 diabetes during lockdown for the covid-19 pandemic in India: a cohort analysis. *Diabetes & Metabolic Syndrome*, 14(5), 949-952. DOI: <https://doi.org/10.1016/j.dsx.2020.06.020>
- Ghosh A., Arora, B., Gupta, R., Anoop, S., & Misra, A. (2020). Effects of nationwide lockdown during covid-19 epidemic on lifestyle and other medical issues of patients with type 2 diabetes in north India. *Diabetes & Metabolic Syndrome*, 14(5), 917-920. DOI: <https://doi.org/10.1016/j.dsx.2020.05.044>
- Gleeson, M., Nieman, D. C., & Pedersen, B. K. (2004). Exercise, nutrition and immune function. *Journal of Sports Sciences*, 22(1), 115-125. DOI: <https://doi.org/10.1080/0264041031000140590>
- Hammami, A., Harrabi, B., Mohr, M., & Krusturup, P. (2020). Physical activity and coronavirus disease 2019 (covid-19): specific recommendations for home-based physical training. *Managing Sport and Leisure*, 1(1), 1-6. DOI: <https://doi.org/10.1080/23750472.2020.1757494>
- Hauge, A., Brand-Miller, J. C., Christophersen, O. A., McArthur, J.O., Fayet-Moore, F., & Truswell, A. S. (2007). A food 'lifeboat': food and nutrition considerations in the event of a pandemic or other catastrophe. *Medical Journal of Australia*, 187(11/12), 674-676. DOI: <https://doi.org/10.5694/j.1326-5377.2007.tb01471.x>
- Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L. ... Bullmore, E. (2020). Multidisciplinary research priorities for the covid-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*, 7(6), 547-560. DOI: [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1)
- Kalantar-Zadeh, K., & Moore, L. W. (2020). Impact of nutrition and diet on covid-19 infection and implications for kidney health and kidney disease management. *Journal of Renal Nutrition*, 30(3): 179-181. DOI: <https://doi.org/10.1053/j.jrn.2020.03.006>.
- Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B. X. ... Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *The Lancet Psychiatry*, 7(3), e14
- Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y. ... Feng, Z. (2020). Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *The New England Journal of Medicine*, 382(1), 1199-1207.

- Lin, X., Zhang, X., Guo, J., Roberts, C. K., McKenzie, S., Wu, W-C., ... Song, Y. (2015). Effects of exercise training on cardiorespiratory fitness and biomarkers of cardiometabolic health: a systematic review and meta-analysis of randomized controlled trials. *Journal of the American Heart Association*, *4*(7), 1-28.
- Liu, S., Yang, L., Zhang, C., Xiang, Y-Y., Liu, Z., Hu, S. & Zhang, B. (2020). Online mental health services in China during the covid-19 outbreak. *The Lancet Psychiatry*, *7*(4), e17-e18. DOI: [https://doi.org/10.1016/S2215-0366\(20\)30077-8](https://doi.org/10.1016/S2215-0366(20)30077-8).
- Alwan, N. A., Bhopal, R., Burgess, R. A., Colburn, T., Cuevas, L. E., Smith, G. D., ... Wilson, A. (2020). Evidence informing the UK's covid-19 public health response must be transparent. *Lancet*, *395*(10229), 1036-1037. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30667-X](https://doi.org/10.1016/S0140-6736(20)30667-X)
- Misra, A., Sattar, N., Tandon, N., Shrivastava, U., Vikram, N. K., Khunti, K., & Hills, A. P. (2018). Clinical management of type 2 diabetes in south Asia. *The Lancet. Diabetes & Endocrinology*, *6*(12), 979-991.
- Naja, F., & Hamadeh, R. (2020). Nutrition amid the covid-19 pandemic: a multi-level framework for action. *European Journal of Clinical Nutrition*, *74*(1), 1117-1121. DOI: <https://doi.org/10.1038/s41430-020-0634-3>
- Pal, R., Yadav, U., Verma, A., & Bhadada, S. K. (2020). Awareness regarding covid-19 and problems being faced by young adults with type 1 diabetes mellitus amid nationwide lockdown in India: a qualitative interview study. *Primary Care Diabetes*, *15*(1), 10-15. DOI: <https://doi.org/10.1016/j.pcd.2020.07.001>
- Parnell, D., Widdop, P., Bond, A., & Wilson, R. (2020). Covid-19, networks and sport. *Managing Sport and Leisure*, *1*(1), 1-7. DOI: <https://doi.org/10.1080/23750472.2020.1750100>
- Pfefferbaum, B., & North, C. S. (2020). Mental health and the covid-19 pandemic. *New England Journal of Medicine*, *383*(6), 510-512. DOI: <https://doi.org/10.1056/NEJMp2008017>
- Sankar, P., Ahmed, W. N., Koshy, V. M., Jacob, R., & Sasidharan, S. (2020). Effects of covid-19 lockdown on type 2 diabetes, lifestyle and psychosocial health: a hospital-based cross-sectional survey from South India. *Diabetes & Metabolic Syndrome*, *14*(6), 1815-1819. DOI: <https://doi.org/10.1016/j.dsx.2020.09.005>
- Turkish Dietetic Association [TDA]. (2020). *Turkish dietetic association's recommendations on nutrition and covid-19*. Retrieved from <http://www.efad.org/media/1956/turkish-dietetic-association-nutrition-recommendations-about-coronavirus-covid-19.pdf>
- Verma, A., Rajput, R., Verma, S., Balania, V. K., & Jangra, B. (2020). Impact of lockdown in covid-19 on glycemic control in patients with type-1 diabetes mellitus. *Diabetes & Metabolic Syndrome*, *14*(5), 1213-1216.
- World Health Organization [WHO]. (2020a). *WHO director-general's opening remarks at the media briefing on Covid-19 - 11 March*. Geneva, CH. Retrieved from <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.
- World Health Organization [WHO]. (2020b). *Covid-19 situation reports*. World Health Organization. Retrieved from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
- Wypych, T. P., Marsland, B. J., & Ubags, N. D. (2020). The impact of diet on immunity and respiratory diseases. *Annals of the American Thoracic Society*, *14*(Suppl. 5), S339-S347.