

Understanding the risk of Non-Communicable Diseases through the lens of a communicable disease: Lifestyle changes of young adults during COVID-19

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Abstract -

Background: The world is experiencing an unprecedented challenge due to COVID-19 pandemic. Lockdown measures had been enforced in many countries to restrict the spread of this communicable disease which had unforeseen detrimental effects on lifestyle habits. Non-communicable diseases (NCDs) are non-contagious, related to the interaction of various genetic, environmental, and lifestyle factors that contributed to around 5.87 million (60%) of all deaths in India. Pandemic led to harmful health behaviors, such as overeating, sedentary behavior with reduced physical activity, and increased screen time causing impaired sleep. India poses a huge burden of NCDs and their risk factors which could synergize with COVID-19 for serious illness and outcome. **Purpose:** The main objective of this study is to describe the lifestyle-related behavior changes during the COVID-19 pandemic among young adults living in the southern states of India. **Methods:** An Ex-post Facto research design is used for this study. A cross-sectional survey method is utilized to collect data from a sample of 166 young adults aged 18-25 years comprising 95 females and 71 males. Lifestyle behavior questionnaire (LBQ; Archana Kumari et al, 2020) was used to assess the change in lifestyle. Data was analyzed, using descriptive statistics. **Major findings:** There is a significant change in the lifestyle behavior of young adults during the COVID-19 pandemic which are risk factors for development of NCDs. **Conclusion:** A need for understanding the vicious cycle of lifestyle changes in young adults during COVID-19 as risk factors for NCDs are serious implications for healthcare policymakers and professionals.

Keywords: NCDs, communicable disease, lifestyle changes, young adult, Covid-19 2

INTRODUCTION

India currently has the largest share of the youth population in the world, 34.8 percent as per the 2011 Census, and would continue to hold so for the next 20 years. As per 'World Population Prospects: The 2015 revision' Population Database of United Nations Population Division, India has the world's highest number of 10 to 24-year-olds, with 242 million-despite having a smaller population than China, which has 185 million young people. Adolescence is arguably the last best chance to build positive health habits and limit damaging ones. Adolescence is a time when the influence of peers and parents, as well as the targeted marketing of unhealthy products and lifestyles, is significant.^[5]

Every year, roughly 5.8 million Indians die from heart and lung diseases, stroke, cancer, and diabetes. In other words, 1 in 4 Indians risks dying from a non-communicable disease (NCD) before they reach the age of 70.^[22] Lifestyle has long been associated with the development of many chronic diseases and non-communicable diseases (NCDs).^[30] WHO has identified four major NCDs, i.e., diabetes, CVDs, cancer, and chronic lung disease/chronic obstructive pulmonary disease (COPD) which share common lifestyle-related behavioral risk factors.

These risk factors are tobacco use (smoking/chewing), physical inactivity, unhealthy diet, and alcohol use leads to key metabolic and or physiological changes like raised blood pressure (BP), overweight/obesity, raised blood glucose, and raised cholesterol levels.^[19] Many studies have shown that the prevalence of risk factors of NCDs in the early phase of life, i.e., childhood and adolescence bears significant tendency toward development of disease in adulthood.^[7]

NCDs are a leading global public health problem, as established by the United Nations 3

Summit on NCDs in September 2011.^[29] NCDs contribute to around 38 million (68%) of all the deaths globally and to about 5.87 million (60%) of all deaths in India (WHO, 2014). A substantial proportion of these deaths are in the productive age-group and all of them are preventable in nature. But, the rising challenge due to NCDs is that it is increasingly affecting the younger populations.^[21]

In a recent report of India Council of Medical Research (ICMR) titled India: Health of the Nation's States: The India State-Level Disease Burden Initiative (2017), it is observed that the disease burden due to communicable, maternal, neonatal, and nutritional diseases, as measured using disability-adjusted life years (DALYs), dropped from 61 percent to 33 per cent between 1990 and 2016. In the same period, disease burden from non-communicable diseases increased from 30 per cent to 55 per cent.

According to the National Health Profile 2019, 6.51 crore patients were screened at NCD clinics as part of the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) from January 1 to December 31, 2018. Of these, 4.75 % of patients were diagnosed with diabetes, 6.19 per cent with hypertension, 0.3 per cent with cardiovascular diseases, 0.10 per cent with stroke and 0.26 % were diagnosed with common cancers. Acute respiratory infections contributed 69.47

per cent to the morbidity burden in the country followed by acute diarrhoeal diseases at 21.83 per cent.

Cases of cholera showed an increase from 508 in 2017 to 651 in 2018, with Uttar Pradesh recording the largest number of cases followed by Delhi and West Bengal. The cases of typhoid went up to 23,08,537 in 2018 from 22,64,453 in 2017.^[27]

NCDs are no more limited to the urban cities and towns in India. A study in the south 4

Indian state of Andhra Pradesh has reported that even in rural India the leading cause of death (32%) is due to NCDs followed by injuries and external cause of deaths (12%).^[14] As per the study in 2017, led by Professor Lalit Dandona, of the Gurugram-based Public Health Foundation of India, more developed states such as Kerala, Goa, and Tamil Nadu had a higher burden of non-communicable diseases compared to Madhya Pradesh, Uttar

Pradesh, Uttarakhand, Rajasthan, Jharkhand, Chhattisgarh, Odisha, Bihar-- and Assam and northeastern states.^[11]

The WHO has identified India as one of the nations that is going to have most of the lifestyle-related disorders in the near future. However, the important fact is that not only are lifestyle disorders becoming more common, but they are showing a drastic shift toward the younger population.^[7] In India, the age of onset of NCDs is in young adults. More than two-thirds (61.8%) of the deaths in India are contributed by NCDs (cardiovascular diseases -28.1%, chronic respiratory diseases -10.9%, neoplasms -8.35%, diabetes - 6.5%, and other urogenital, blood, and endocrine diseases). The risk of premature deaths (<70 years) due to NCDs is 23%. The prevalence of NCDs in all age groups has increased over the years.^[11]

The emergence of Coronavirus disease (COVID-19) has led the world to an unprecedented public health crisis. Emergency protocols were implemented in India to control the spread of the virus which resulted in restrictions on all non-essential public movements.^[28]

This rapid evolution at such a large scale has had profound effects on how people around the world are living their lives resulting in changes in daily life schedule, daily physical activity level, mental activity level, food intake level, sleep duration, etc.^[33]

Such lifestyle changes that detract people from activity and push them towards a 5

sedentary routine can cause a number of health issues that can lead to chronic non-communicable diseases that can have near life-threatening consequences.^[31] The responses to COVID-19, including lockdowns, physical distancing, and self-isolation may

increase exposure to some NCD risk factors such as increased alcohol and tobacco use as coping mechanisms, barriers to physical activity, and unhealthy diet. This will pose a new challenge for a currently healthy population being exposed to NCD risk factors, and will face the burden of NCDs later in life.^{[4][21]}

Older people are most at risk of severe health issues related to the virus, but young adults may be most vulnerable to its long-term health, social, and economic impacts since they are especially vulnerable to the greater societal shifts being witnessed as a result of the virus. Young people tend to experience high levels of emotional distress despite being at lower risk for COVID-19 complications.^[27] Communicable diseases are illnesses caused by viruses or bacteria that people spread to one another through contact with contaminated surfaces, bodily fluids, blood products, insect bites, or through the air.^[32] Covid-19 is one such communicable disease that has been spreading at an enormous rate and has caused deaths beyond expectations due to a variety of reasons.^[3] International agencies are now appealing to governments to ensure that NCDs prevention and treatment are included in national preparedness plans, beginning with the inclusion of NCDs in national COVID-19 responses as part of global health security.^[25]

The present study is an attempt to find out the effect of this pandemic-led lockdown on the lifestyle of young adults and how it paves the way to give rise to other non-communicable diseases in the long run. This current study was conducted through a survey among the young adults residing in the southern region of India to understand the

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effects of the lockdown on the reported lifestyle habits changes as risk factors for non-communicable diseases.

METHODOLOGY

Research design and technique: An Ex-post Facto research design was used for this study and the participants were selected using convenience sampling technique and snowball sampling technique. **Participants:** A total of 166 participants consented to

complete the survey. **Sample description:** 57.2% of young adults were females and 42.7% of them were males from South India namely from Tamilnadu (n=52), Andhra Pradesh (n=5), Kerala (n=51) and from Karnataka (n=58); 76.5% of them belonged to the 18-21 years of age group and 23.5% of them belonged to the 22-25 years of age group; 152 participants were undergraduates and unemployed whereas only 14 young adults were employed. **Sampling procedure:** Convenience sampling procedure. **Data collection**

method: An ethical clearance was obtained by researchers to conduct the present study and a detailed informed consent was taken by all participants of this study. A cross-sectional survey method was utilized to collect data. Ethical clearance was obtained by the researchers to collect the data. **Tool:** Lifestyle Behavior Questionnaire is a pre-tested, structured, close-ended, self-administered

questionnaire.^[16] LBQ consists of 20 items to assess lifestyle-related behavior and was used for gathering data in this study. The questionnaire shows a satisfactory validity and a good internal consistency with the Cronbach's alpha value of 0.72 that suggest a good internal consistency. **Method to analyze data:** Descriptive statistical analyses such as frequency and percentage were used to

describe the nature and characteristics of data distribution consisting of 166 samples of young adult population.

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RESULTS

The descriptive statistical analysis found that among the young adults in the present study (N=166), 10.8 % had above the significantly increased level of unhealthy eating habits as per the scoring norms of Lifestyle Behavior Questionnaire (LBQ) while 20.4 % had significantly increased their healthy eating habits. In terms of physical activity, 28.1 % of the participants significantly increased in physical activity while 47.9% had a significant increase in the lack of physical activity as the scoring norms of LBQ. With regard to duration and quality of sleep, 50.3 % of the young adults had grossly similar patterns of sleeping before and during covid pandemic.

DISCUSSION

The present study is an attempt to assess the impact of lifestyle-related behavior changes (eating habits, physical activity and sleep patterns) during COVID-19 pandemic among the young adults living in southern states of India and also determining it as a risk factor

for non-communicable diseases. Exposure to some NCD risk factors such as mental health, barriers to physical activity, unhealthy diet etc. This will pose a new challenge for a currently healthy population being exposed to NCD risk factors, and will face the burden of NCDs later in life. This questionnaire assisted in quick assessment of lifestyle-related behavior of young adults, especially during pandemic. The questionnaire consists of 20 items covering all important information required to assess the eating habits, physical activity and sleep cycle. The diet-related items of the questionnaire assess the consumption of main meals, snacking habits, intake of healthy food items and consumption of unhealthy food items. The diet-related items of the questionnaire (1 to 14) assess the consumption of main meals, intake of healthy food items like whole grain

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and high fiber varieties, fruits and green leafy vegetables, eggs, nuts and consumption of unhealthy food items such as food that is high in calories from sugar or fat, fried and junk foods. Besides, there are also few items dedicated to assessing the intake of immunity-boosting foods like citrus fruits, green leafy garlic, ginger, berries, spinach, vegetables etc. There are other items in the questionnaire (15–17) pertaining to physical activity assessing the individual's involvement in aerobic exercise, household-related activities, sitting time and screen time. Questions (18-20) determined sleep duration and mental health of an individual.

Healthy and unhealthy eating habits: Unhealthy diets are a key modifiable behavioral risk factor for non-communicable diseases (NCDs) (Olatona et al., 2018).^[23] The dietary habits of young adults in low-to-middle income countries have rapidly shifted to less-healthy diets (consisting of processed foods, increased use of edible oils and sugar-sweetened beverages).^[24] Young adults are more prone to obesity in the transition from childhood/adolescence to adulthood which involves a significant life change, including unfavorable changes in health-related behaviors and weight gain for many students.^{[10][12]}

Immunity boosting food eating habits: Immunity is the ability to defend against infection and disease. Good nutrition plays an important role in delaying the progression of cardiovascular disease and diabetes.^[1] A variety of fruits, vegetables, oily fish, olive oil, nuts, legumes and low-fat dairy products and limited consumption of red meat, saturated fat, and added sugar is advocated, mostly based on positive associations with cardiovascular health. Dietary patterns that follow these principles include the Dietary Approaches to Stop Hypertension (DASH) diet, a diet rich in fiber, protein, magnesium,

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calcium, and potassium, and low in total and saturated fats, which has been shown to reduce low-density lipoprotein (LDL)-cholesterol levels, and the Mediterranean diet, which has been shown to reduce the risk for chronic non-communicable diseases as well as improved immune function.^[9]

Physical activity: WHO defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure. Regular and adequate levels of physical activity: improve muscular and cardiorespiratory fitness; improve bone and functional health; reduce the risk of hypertension, coronary heart disease, stroke, diabetes, various types of cancer (including breast cancer and colon cancer), and depression; reduce the risk of falls as well as hip or vertebral fractures; and are fundamental to energy balance and weight control. As per World Health Organization (WHO), physical inactivity (insufficient physical activity) is one of the leading risk factors for noncommunicable diseases (NCDs) and death worldwide. Strong evidence shows that physical inactivity increases the risk of many adverse health conditions, including the world's major NCDs of coronary heart disease (CHD), type 2 diabetes, and breast and colon cancers, and shortens life expectancy.^[17]

Sleep duration: Sleep is affected by and affects NCDs but it is a frequently neglected aspect of health and well-being. Insufficient and/or mistimed sleep is also a major risk factor for obesity and NCDs such as cardio-vascular diseases (CDM) and Type-2 Diabetes Mellitus (T2DM).^{[6][13]} It has been found that both short and long sleep are associated with higher mortality rates and increased risk for CVD.^[8] US National Health Interview Survey data indicate that relative to sleeping 7–8 h per night, self-reported short (≤ 6 h) and long sleep (>9 h) duration are independently associated with increased

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obesity, T2DM, hypertension, and CVD.

The effects of the global COVID-19 pandemic on the development of NCDs is devastating as people during lockdown and self-isolation tend to eat more and exercise less. The consumption of unhealthy food items such as meat, sugar-sweetened beverage consumption, and iron-based diets has been increased, which in turn, is linked to development of NCDs. It has been predicted that in the coming future, when the battle with COVID-19 is won, the health system may be overwhelmed with the many occurrences of NCDs. The findings of the current study have strong implications for healthcare policy makers, health care professionals, mental healthcare professionals, families, parents, higher educational institutions, and workplace counselors. Early identification and management of risk factors of NCDs identified in this study is the urgent need of the hour. Preventive and intervention models which are easily accessible for all young adults is a possible solution which can be implemented using psychoeducational awareness and mass media campaigns.

CONCLUSION

The findings of this study conclude that there are alarming changes in lifestyle behavior of young adults during the Covid-19 pandemic which pose risk factors for developing NCDs. A need for understanding the vicious cycle of lifestyle changes in young adults during COVID-19 as risk factors for Non-communicable disease needs to be stressed at national levels are serious implications for healthcare policy makers and health care professionals considering the valuable assets of India- the young adult

population.

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Appendix

Lifestyle behavior questionnaire (Archana Kumari et al, 2020) A. Instruction: For question numbers 1-20 select one of the following options as your response: (a) Significantly increased (b) Slightly increased (c) Grossly similar (d) Slightly decreased (e) Significantly decreased.

S.No.	Items of the questionnaire Questions (items)
1.	During COVID pandemic, how has your probability of skipping one of the main meals (breakfast/lunch/dinner) changed?
2.	During COVID pandemic, how has your habit of snacking between meals changed?

3.	During COVID pandemic, how has your quantity/portions of meals and snacks changed?
4. 5.	During COVID pandemic, how has your daily intake of fruits and vegetables changed? During COVID pandemic, how has your intake of a balanced diet (including healthy ingredients such as whole wheat, pulses, legumes, eggs, nuts, fruits and vegetables) changed?
6.	During COVID pandemic, how has your consumption of junk food/fast food and fried food changed?

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7. 8.	During COVID pandemic, how has your intake of sugar-sweetened beverages (<u>carbonated soft drinks, sugar-sweetened juices</u>) changed? During COVID pandemic, how has your consumption of sweets/candies/chocolate changed?
9. 10.	During COVID pandemic, how has your participation in cooking new/traditional recipes changed? During COVID pandemic, how has your consumption of unhealthy food when you are bored or stressed or upset changed?

11.	During COVID pandemic, how has your intake of immunity-boosting foods (lemon, turmeric, garlic, citrus fruits and green leafy vegetables) in the diet changed?
12.	During COVID pandemic, how has your intake of nutrition supplements to boost immunity changed?
13.	During COVID pandemic, how has the support of your family and friends in eating healthy changed?
14.	During COVID pandemic, how has your interest in learning healthy eating tips from the media (newspaper articles/magazines blogs/videos/TV shows/text messages) changed?
15.	During COVID pandemic, how has your participation in aerobic exercise changed?

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16.	During COVID pandemic, how has your participation in leisure and household chores changed?
17.	During COVID pandemic, how has your sitting and screen time changed?
18.	During COVID pandemic, how have your hours of sleep changed?

19.	During COVID pandemic, how has your quality of sleep changed?
20.	During COVID pandemic, how have your stress and anxiety levels changed?

B. Scoring instructions for the questionnaire to assess impact of lifestyle changes of young adults during COVID-19 as risk factors for Non-communicable diseases.

Items 1, 2, 6, 7, 8, 9*, 10, 17 and 20 are scored as: 2 = Significantly decreased, 1 = Slightly decreased, 0 = Grossly similar, -1 = Slightly increased, -2 = Significantly increased.

Items 4, 5, 11, 12, 13, 14, 15, 16 and 19 are scored as: 2 = Significantly increased, 1 = Slightly increased, 0 = Grossly similar, -1 = Slightly decreased, -2 = Significantly decreased.

Item 3**, 18*** is scored as: 0 = Grossly similar -1 = Slightly increased/decreased -2 = Significantly increased/decreased

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*Item 9 is scored assuming that these recipes are usually high in calories.

**Item 3 is scored assuming that the person was having normal portion of meals and snacks before COVID pandemic.

** Item 18 is scored assuming that the individual was having an adequate 6-8 hours sleep before pandemic.

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