



THE ASSESSMENT OF LIFESTYLE CHANGES DURING THE COVID-19 PANDEMIC BY USING A MULTIDIMENSIONAL STUDY

Hamed AliKarrar Ibrahim*, Mazin Aboobaida Abdalla, Dr. Ishrar, Osama Ibrahim, Omer Awad, Abdalla Omer Abdalla

Department of Pharmacy Practice, Raghavendra Institute of Pharmaceutical Education and Research (RIPER)-Autonomous, K. R. Palli Cross, Ananthapuramu-515721, Andhra Pradesh, India

**Corresponding author: Email: hamid2288@gmail.com*

ABSTRACT

The novel coronavirus (COVID-2019) has spread very rapidly all over the globe, causing an outbreak of acute infectious pneumonia (Bao et al., 2020). The novel coronavirus is spreading rapidly all over the world resulting in 30,364,115 confirmed cases, including 950,770 deaths globally as of 18th September 2020. In India 5,214,677 confirmed cases and 84,404 deaths had occurred as of 18/09/2020. Continuous spread of the epidemic, strict isolation measures, and delays in starting schools, colleges, universities, shopping malls, private and public areas across the country are expected to influence the lifestyle of the general public. The online questionnaire consists of demographics. Among a total sample of 720, 87.50% of the respondents are experiencing psychological upset, 62.20% of the public has experienced bad health among them males are more in number when compared to female participants. Along with that, more than 62% of the participants were negative for covid, more than 70 % have self-isolated. There is no significant difference with the demographic factors like age, gender. The COVID 19 related stressors like sleep pattern, physical activity, diet, stress management strategy affected daily life, co-morbidities, and social support. The public has Anxiety & Depression due to COVID 19 pandemic; The mental health of the general public is significantly affected when faced with public emergencies, and they require attention, help, and support of the society and families. It is suggested that the government and general public should collaborate to resolve this problem to provide high-quality, timely crisis-oriented psychological services to the general public.

Key Words: Covid-19, Lifestyle, Multidimensional, Stress management, Diet and Nutrition.

DOI Number: 10.48047/NQ.2023.21.2.NQ23075

NeuroQuantology 2023; 21(2):747-761

INTRODUCTION

Since the first identification of human cases with symptom onset in December 2019 in Wuhan, China, severe acute respiratory

syndrome –coronavirus -2 has spread rapidly across the globe, infected more than 30 million people in 212 countries and territories, and caused 950000 deaths as of September 2020.



The coronavirus in 2019 has created an onerous burden on the global health care system and

has led to an unprecedented increase in demand for intensive care units.

Types of coronaviruses:

Table 1 summarizes the main differences between SARS-CoV, SARS-CoV-2, and MERSCoV coronavirus diseases in terms of symptoms, emergence, incubation period, transmission, and biological characteristics.

S. No	Human coronavirus name	Illness
1.	SARS-CoV-2	COVID-19
2.	SARS-CoV	Severe acute respiratory syndrome (SARS)
3.	MERS-CoV	The Middle East respiratory syndrome (MERS)
4.	HCoV-NL63	Usually, mild respiratory illness
5.	HCoV-229E	
6.	HCoV-OC43	
7.	HKU1	

1.1. Multi-dimensional Assessment

The multidimensional scale used to assess effects of COVID-19 on Mental Health Currently, lifestyle is seen as a multidimensional construct encompassing a wider range of behaviours, such as smoking, alcohol/substance misuse, stress management, social support, and Screen time and the use of digital technologies 2 and 3 Healthy lifestyles have been shown to have a critical impact in reducing all-cause mortality and maintaining people's health and well-being on several occasions.

1.2. Signs and Symptoms of Corona Infection:

SARS-CoV-2 mainly attacks the lower respiratory system causing viral pneumonia, emerging data suggest that it may also damage the heart, gastrointestinal system, liver, kidney, and central nervous system, resulting in multiple organ failure.

Symptoms might range from mild to severe in anyone. People with these symptoms may have COVID-19:

- Fever or chills, Cough
- Shortness of breath or difficulty breathing
- Fatigue, Diarrhea
- Muscle or body aches, Headache
- New loss of taste or smell, Sore throat
- Congestion or runny nose
- Nausea or vomiting

1.3. Diagnostic and Treatment Strategies for COVID-19

This information covers previously utilised anti-infectious-disease techniques, contemporary clinical studies, and FDA-approved diagnostic and therapy methods. A comprehensive search of Pub Med, Web of Sciences, and the FDA, NIH, and WHO websites yielded the literature.



1.RT-PCR

Because of its ability to provide quantitative genetic analysis of DNA and RNA, PCR has become a common diagnostic and research technique. The most often used diagnostic procedures for identifying COVID-19 are nucleic acid amplification methods such as RT-PCR, real-time, and reverse transcription loop-mediated isothermal amplification, with the latter being regarded the most accurate.

2.RT-LAMP

LAMP is a low-cost, single-tube method for amplification of DNA after reverse transcription. With the greater number of primers, RT-LAMP employs DNA polymerase and 4–6 primers, including two inner primers and two outside primers that chemically bind to six particular locations on the target genome, making this technique very specific. For COVID-19 detection, many RT-LAMP assays have been developed. In less than 30 minutes, a quick screening RT-LAMP diagnostic test for COVID-19 infections was developed.

3.Chest-CT

In light of diagnostic test kit shortages and presumed false-negative RT-PCR testing, clinical diagnosis utilising CT imaging has played a crucial role in the early discovery and management of COVID-19. A chest CT scan includes obtaining X-ray attenuation data in a cross-sectional plane of the thorax at various rotational angles. This information is then utilised to create a computerised cross-sectional picture of the chest that shows the various lobes of the lungs and is especially useful for highlighting soft tissues.

GENOMIC ASSAY-BASED RAPID TESTS

A promising method that enables the rapid detection of SARS-CoV-2 targets multiple regions of the viral genome through a multiple gene assay. As described above, LAMP is a powerful method that facilitates platforms for rapid molecular diagnosis of SARS-CoV-2. This test uses the LAMP technology technique to

target the E gene in the SARS-CoV-2 genome profile.

Existing Antiviral Drugs

Given that the viral load in sputum might remain up to two weeks, using antiviral medications soon after the beginning of COVID-19 symptoms can help to prevent transmission by decreasing viral shedding in respiratory secretions. Antiviral medicines such as neuraminidase, ganciclovir, acyclovir, ribavirin, and methylprednisolone are commonly used, although none are currently indicated for COVID-19 therapy.

Immunoglobulin Therapy

In March 2020, the FDA issued recommendations to initiate studies on the administration of investigational convalescent plasma collected from patients who had recovered and were symptom-free from COVID-19 for 28 days. Additionally, high dosage intravenous IVIg was given as a potent immune modulator, showed that CP was well tolerated in 10 severe adult cases of COVID-19 and led to the disappearance of viremia within 7 days.

Vaccines

Vaccinations using pathogen-specific antigens can prevent viral infection or reduce disease severity, thereby reducing viral transmission. While there is no current vaccine for COVID-19, strategies employed to develop the experimental SARS-CoV and MERS-CoV vaccines may prove beneficial for SARS-CoV-2 vaccine development.

METHODOLOGY

This is a cross-sectional, online survey performed in accordance with the Declaration of Helsinki's guidelines for human subject research, was conducted for a period of 6 months from January 2020 to June 2020. After getting ethical approval from the IRB. The study population included individuals from all over India, who have access to the Internet and who agree to participate in the study after reading the informed consent form, with a minimum of primary education and considering



an age limit above 12-55 years with a possibility to operate telephonic answers irrespective of their gender were included in the study.

Those who are not interested to participate in the study. Population above 55 years due to chronic diseases probability and Public diagnosed with the psychiatric disorder before pandemic was excluded.

Convenience sampling was used and the required sample size was calculated using Epi-info software, expected frequency 50%, a margin of error 5%, design effect 1, 95 % confidence interval, sample size became 743. By considering the 15 % non-response rate final sample size became 720.

The study protocol was designed and prepared as per the institutional review board. and initiated with the designing of an online questionnaire for the assessment of Life-Style Changes during the Covid-19 Pandemic among the General Public.

The survey tool was circulated in various messenger groups (WhatsApp, We Chat, IMO),

and social media networks (Facebook, Twitter, Instagram, and LinkedIn).

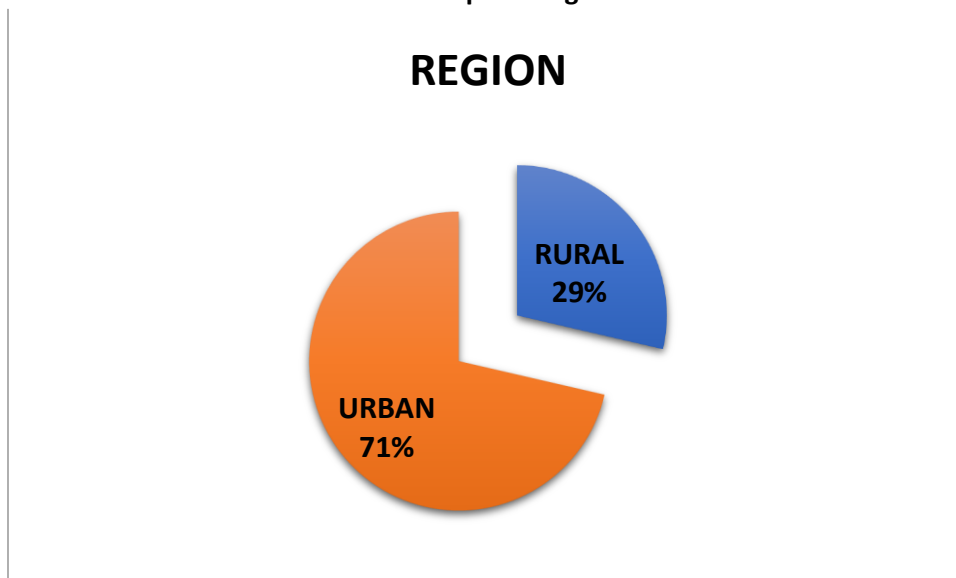
The first page of the form describes the background, core objectives, and expected outcomes of the survey. The respondent needs to opt suitable answer for the first question (are you willing to join in this online survey) to enter into the study.

The data was collected through online mode by providing a link to fill Google Forms questionnaire/survey tool comprising demographics, perceived health status, and COVID19 experience, Short Multidimensional Inventory Lifestyle Evaluation –CONFINEMENT related answers. A total of 743 responses were taken into the final analysis.

Results

An online survey was conducted among 720 general public of different fields; the questionnaire was forwarded through social media platforms, among them 270 were female and 450 were male.

Graph: 1 Region Wise Distribution



The above figure shows that majority of the population are from age urban region.

Table: 1 distribution of demographic details of respondents



Demographics	Total (N)	Percentage (%)	p-value
Gender Female Male	270 450	37.5% 62.5%	0.329 [□]
Region Rural Urban	206 514	28.61% 71.39%	0.45 [□]
Education Level Primary/Secondary Education	115 379 167	15.97% 52.64% 23.19%	>0.0001 ^{□*}
Bachelor/Professional degree Postgraduate degree Doctoral degree	59	8.19%	
Working status Not working Working (Not as essential labour) Working (as essential labour) Lost job during a pandemic	59 167 94 414	6.1% 13.05% 23.3% 57.5%	>0.0001 ^{□*}

751

The above table represents the distribution of age, region, working status, and education levels of respondents. Table 1 describes the socio-demographic and clinical characteristics of the respondents who were analyzed for this analysis age of participants was taken as a categorical variable (n=720, mean± standard

deviation=27.76±10.658). A total of 720 were included in the study of which 270(37.5%) were females and 450(62.5%) were males and obtained p-value was 0.329 which was statistically insignificant. 206(28.61%) are rural and 514(71.39%) are urban residents and



obtained p-value was 0.45 which was statistically insignificant. 115(15.97%) are in Primary/secondary education, 379 (52.64%) pursuing Bachelor/professional degrees, 167(23.19%) are pursuing a post-graduate degree and 59(8.19%) are pursuing a doctoral degree and obtained p-value was <0.0001 which was statistically significant and there are differences in the education level of participants. 414(57.5%) are not working,

94(13.05%) are working (not as essential labor), 168(23.33%) are working (as essential labor) and 44(6.1%) lost a job during the pandemic and obtained p-value was <0.0001 which was statistically significant and there were differences of participants in working status. The above figure shows that majority of the population were in self-isolation even though maximum respondents were not positive for covid-19.

S. No	In this pandemic (first and second wave), How Often in Your Daily Routine... n=720)				
1.	1Have You Been Diagnosed with Covid-19?				
	Yes-248	34.30%		No-478	66.38%
2.	Have You Been Self Isolated?				
	Yes-352	48.8%		No-374	51.94%
3.	Realized Any Self-Reported Change on Pattern of Indoor/Outdoor Time During the Covid-19 Pandemic?				
	No (23.62%)	Changes-170	Completely Door162 (22.5%)	In Indoor Less and Outdoor More114 (15.8%)	Indoor More and Outdoor Less 280 (38.8%)
4.	Have You Been Committed to The Social Distance During the Pandemic?				
	Always (52.08%)	375	Often 219 (30.41%)	Seldom 84 (11. 6%)	Never48 (6.6%)
5.	Have You Been Committed to Using Hand Sanitizer During the Pandemic?				
	Always (396)55%	Often (204)28.3%		Seldom (86)11.94%	Never (40)5.5%
6.	Have You Been Committed to Using a Mask During the Pandemic?				
	Always (515)71.52%	Often (148)20.55%		Seldom (37)5.13%	Never (26)3.6%
7.	Have You Diagnosed or Treated One of The Following?				
	Anaemia (32)4.44%	Dm (85) 11.80%	Htun (47)6.52%	Others (G.I, U.T.I) (71)9.86%	No Health Issues (491)68.19%
8.	How Much Do You Rate Yourself Health?				



	Bad (448)62.2%	Good (249)34.5%	Very Bad (6) (0.8)	Very Good (23) (3.19%)
9.	Have You Diagnosed or Treated One of The Following? (During Pandemic)			
	Asthma/Bronchitis/ Tuberculosis (83)11.52%	Psychotic Distress (18)2.5%	Others (renal, liver diseases) (110)15.2%	No Health Issues (508)70.5%

1. Diet and Nutrition

	Have You Changed Your Diet and Nutrition During the Pandemic?			
	No Changes (178)24.72%	Mild Change (Three Times & Supplementary Diet) (183)25.41%	Moderate Change (Three Times Meal+ Supplementary Diet Immune Boosters) dry fruits (213)29.58%	Total Change THREE Times + Supplementary Diet+ Immune Boosters+ Daily Egg (Nonveg)/Milk (152)21.1%
11.	Have You Realized Any Self-Reported Change on Dietary and Nutritional Habits Before and During the Covid-19 Pandemic?			
	No Changes (157)21.80%	Mild Change (191)25.13%	Moderate Change (198)27.5%	Total Change (180)25%

2. Substance abuse

12.	Have You quitted Smoking Tobacco and alcohol consumption (Cigarette, Electronic Cigarette, Cigar, Pipe, and Smokeless Tobacco) during a pandemic?			
13.	No (103) 14.30%	yes (457)63.47%	Never smoked /consumed (160)22.22%	

3. Stress Management

14.	Have You Changed Your Sleep Pattern Before and During the Pandemic?			
	No Changes (218) 30.27%	Mild Change (135)18.75%	Moderate Change (151)20.97%	Total Change (222)30.83%
15.	Have You Realized Any Self-Reported Change on Strategies to Deal with Stress During the Covid-19 Pandemic?			
	Reading Religious Books (165) 22.91%	Sleeping (246)34.16%	Meditation (110)15.27%	Singing Or Listening to Music (205) 28.47%
16.	Have You Screened for Depression and Anxiety (Psychology Feeling)?			



	Negative For Both Depression and Anxiety (86)11.94% (96)13.33%	Positive For Positive and Anxiety Only Depression (103)14.30%	Positive Only Depression (441)61.25%	For Positive Only Depression and Anxiety Fc
4. Social Support				
17.	Have you worried about Life (during a pandemic)?			
	Always (545)75.69%	Often (99)13.75%	Seldom (36)5%	Never (46)6.38%
18.	Have Any Relatives / Friends Been Infected with Covid-19?			
	Yes (501)69.58%		No (225)31.25%	
5. Physical Activity				
19.	Do You Exercise For At Least 30 Minutes Daily Or 150 Minutes A Week? (Before pandemic)			
	Always (196)27.22 %	Often (251)34.86%	Seldom (152)21.11%	Never (154)21.38%
20.	Have You Changed Your Physical Activity During Pandemic Period?			
	No Changes (148)20.55%	Mild Change (143)19.86%	Moderate Change (211)29.30%	Total Change (224)31.11%

754

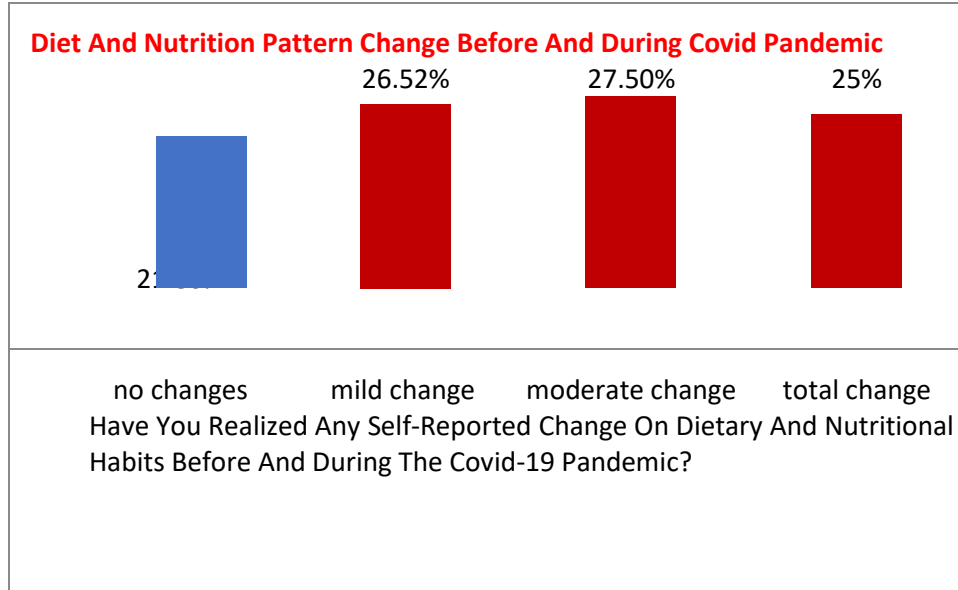
The above table shows responses to the questions related to the COVID 19 stressors asked the participants through the online questionnaire form.

Graph: 2 self-health rating percentage of respondents



The above figure shows that majority of the population felt bad health during the pandemic in a first and second waves.

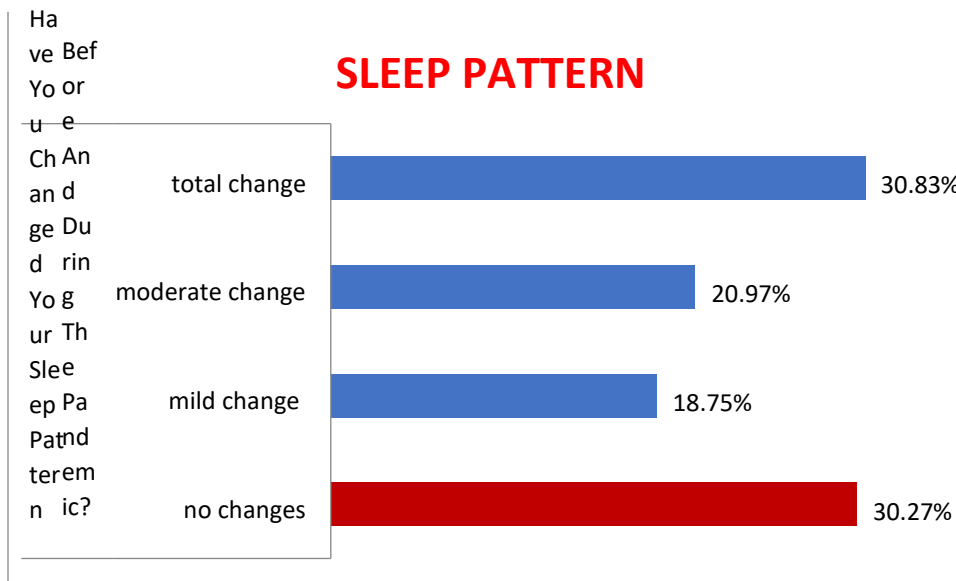
Graph: 3 Diet and Nutrition Pattern Change Before and During Covid-19 Pandemic Percentage of respondents



755

The above figure shows that the majority of the population changed their diet and nutrition during the pandemic in a first and second waves.

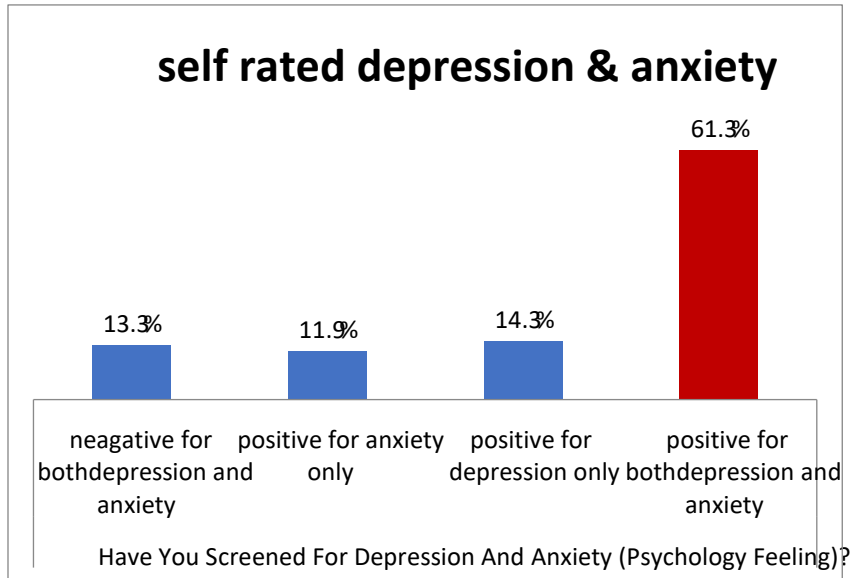
Graph: 4 sleep pattern percentage of respondents during and before the pandemic



The above figure shows that the majority of the population changed their sleep pattern during a pandemic in a first and second waves.

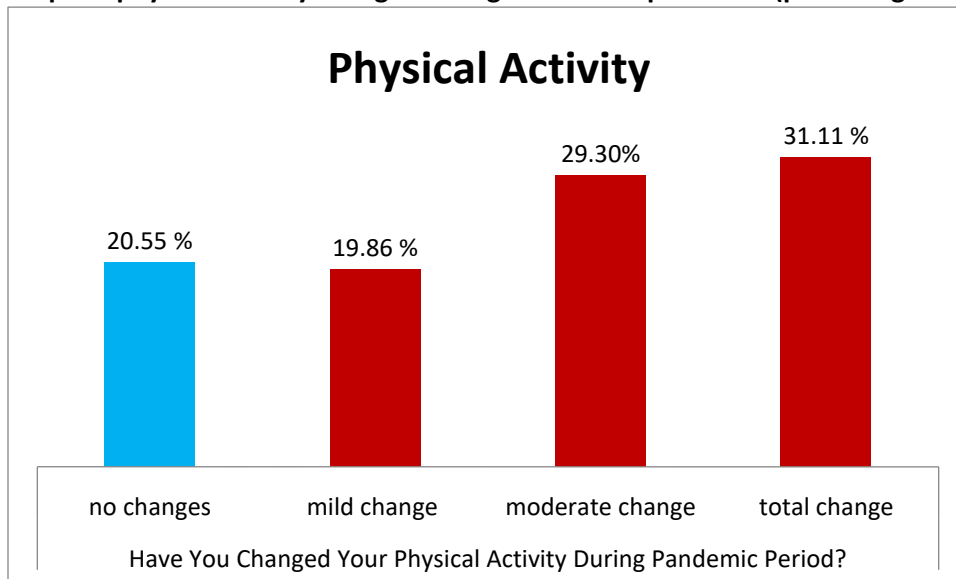
Graph: 5 Percentages of respondents towards depression and anxiety





The above figure shows that majority of the population managed felt positive for both depression and anxiety during Covid-19 the pandemic.

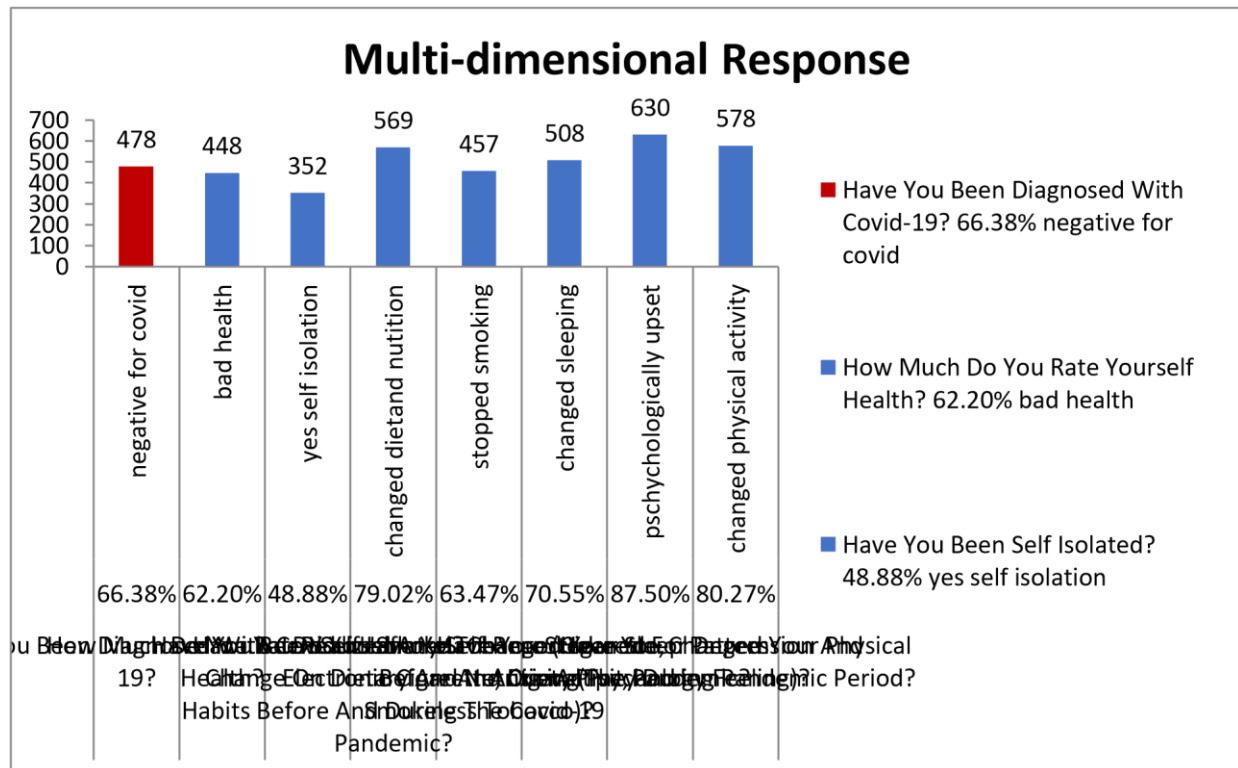
Graph: 6 physical activity changes during and before pandemic (percentage of respondents)



The above figure shows that the majority of the population changed their duration of physical activity during a covid-19 pandemic.

Graph: 7 Overall responses to multidimensional scale (SMILE-C) comparison with negative to covid-19





The above figure shows that the majority of the population changed their diet and nutrition plan, sleeping duration, duration of physical activity during covid-19 pandemic, and the majority of the population felt bad health, felt depressed and anxious even the population not suffered from covid-19 was very low compared to population positive for corona.

S. No	Questionnaire	N	Percentage	P-Value
1.	Diagnosed With Covid 19			
	No	473	65.69 %	>0.0001 [□] *
Yes	247	34.31 %		
2.	Self Isolation			
	Yes	373	51.80 %	0.001 [□] *
No	347	48.19 %		
3.	Relatives/Friends has Been Infected with Covid 19			
	No	224	31.11 %	0.48 [□]
Yes	496	68.89 %		
4.	Self-Rated Health			



	Very Good or Good Regular, Bad, Or Very Bad	620 100	86.11 % 13.89 %	>0.0001 [?] *
5.	Diagnosed Or Treated For			
	Anaemia, Diabetes, Hypertension, Others	487	67.63 %	>0.0001 [?] *
	No Diagnosed Or treated	233	32.36 %	
6.	Diagnosed Or Treated For			
	Asthma/Bronchitis, Lung Cancer, Pneumonia,	504 216	70.0 % 30.0 %	>0.0001 [?] *
	Tuberculosis, Psychotic Distress, And Others			
	No Diagnosed Or treated			
7.	Screening For Depression and Anxiety			
	Negative For Both Depression and Anxiety	436	60.55 %	0.255
	Positive For Anxiety Only	86	11.94 %	
	Positive For Both Depression and Anxiety	95	13.19 %	
	Positive For Depression Only	103	14.30	
8.	Screening For Tobacco Abuse			
	Always	114	15.83 %	0.002*
	Never	457	63.47 %	
	Often	84	11.66 %	
	Seldom	65	9.02 %	



The above table describes 473 (65.69%) are not diagnosed and 247 (34.31%) are diagnosed with COVID 19 and obtained p-value was <0.0001 which was statistically significant and there were differences between the diagnosis of COVID 19 among participants. 373 (51.80%) were not and 347 (48.19%) were self-isolated and obtained p-value was 0.001 which was statistically significant and there were differences in participants of Self-isolation. Relatives/ friends infected with COVID 19 224 (31.11%) were not and 496 (68.89%) were infected and the p-value was 0.48 which was statistically insignificant. Self-rated health, 620 (86.11%) were rated as very good, good and 100 (13.89%) were rated as Regular, bad, or very bad among participants and p-value of <0.0001 was obtained which states that there were differences among participants in self-rated health.

487(67.63%) were not and 233 (32.36%) were diagnosed or treated for Anaemia, Diabetes, Hypertension, and others and a p-value of <0.0001 was obtained which states that there were differences among participants. 504 (70.0%) were not and 216 (30.0%) were diagnosed for Asthma/bronchitis, Lung cancer, lung infection (Pneumonia), Psychotic distress, Tuberculosis, and others and p-value of <0.0001 was obtained which states that there were significant differences among participants. Screening for depression and anxiety, negative for both 436(60.55%), Positive for both 95(13.19%), positive for anxiety only 86(11.94%) and positive for depression only (103(14.30%) and p-value of 0.255 was obtained which was statistically insignificant. Screening for tobacco abuse, 114 (15.83%) were always, 457 (63.47%) were never, 84 (11.66%) and 65 (9.02%) were using tobacco and the p-value was 0.002 which was statistically significant and there were differences in participants for tobacco usage.

DISCUSSION

The present study showed the internal consistency of the smile-c to assess lifestyle behaviours adopted during the covid-19 pandemic-related confinement. Previously, research on fewer elements of lifestyle, such as social support, sleep patterns, and diet/nutrition, have been conducted. 30 - 16 - 20 - 16 - 20 - 16 - 20.

The current study is the first observational study of a wide variety of lifestyle changes during home self-isolation that we are aware of. The smile-c is in line with official, modern conceptions of lifestyle as a multifaceted construct.^{2, 3} The majority of participants were laid off, and 23.5 percent worked in critical services. Only 34.30 percent of those polled said they'd been infected with covid-19, and over 70 percent said they'd lost a loved one as a result of the epidemic. Furthermore, nearly three-quarters of the individuals believed they were in poor health.

The study's initial goal was to characterise the self-reported lifestyle changes that occurred during covid-19 confinement. The domains most susceptible to the impacts of confinement were environmental exposures (indoor versus outside time) and physical activity. These findings were predicted, and they may be explained by the limitations imposed by home isolation. ¹¹ As previously documented, mandated self-isolation has resulted in a decrease in outside activities, which has a negative impact on most forms of physical exercise.³¹ Furthermore, nearly third of the participants reported substantial changes in other lifestyle behaviours, such as stress management, social support, and restful sleep. Previous research has looked at how people's lifestyles changed during previous epidemics in Asia. During the SARS outbreak in Hong Kong³² and the covid-19 pandemic in a Chinese region, large numbers of survey participants indicated positive improvements in support from family and friends, as well as time spent to rest, relax,



and exercise.²⁰ Sleeping difficulties, smoking, and drinking were shown to be more common in 20 studies done during or after times of stress, but not particularly during incarceration. 33–35 At the conclusion of the SARS pandemic in Hong Kong, around 37% of the sample said their stress levels in work and family contexts had increased, while 20% experienced sleep issues during the epidemic. Following calamities other than Eid epidemics, like as the September 11, 2001 terrorist attacks in the United States, increased drug usage has been reported. For example, 5–8 weeks after the September 11 attacks, 28.8% of the sample reported an increase in their usage of any of three drugs (alcohol, cigarettes, and marijuana). Considered together, the current findings are consistent with prior observational studies that demonstrate confinement is linked to changes in normal behaviour patterns.

CONCLUSION

The majority of respondents among the general public were feeling bad health, positive for both depression and anxiousness as a result of the covid19 pandemic. Living alone in self-isolation and without their family members were more prominent domains during the COVID - 19 outbreaks. Even more majority of the people have stopped smoking and alcohol consumption during the pandemic due to the fear of covid-19 related health complications.

The COVID-19- related stressors that included sleep patterns, diet and nutrition changes, stress management, social support, substance abuse, and physical activity effects on daily-life, changes have a significant impact on the lifestyle behaviour of the Indian public during the pandemic. The mental health of the general public is significantly affected when faced with public emergencies, and they require the attention, help, and support of society and families. It is proposed that government professionals and the general public work together to tackle this problem so that

highquality, timely crisis-oriented psychologic care may be provided.

REFERENCES

1. Emedicine.medscape.com. 2021. Coronavirus Disease 2019 (COVID-19) in Children: Practice Essentials, Background, Pathophysiology. [online] Available at: <https://emedicine.medscape.com/article/2500132-overview> [Accessed 9 April 2021].
2. Covid19.who.int. 2021. WHO Coronavirus (COVID-19) Dashboard. [online] Available at: <https://covid19.who.int/> [Accessed 9 April 2021].
3. John, T. and John, K., 2020. Renin-angiotensin-aldosterone system dysregulation and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. *European Heart Journal*, 41(22), pp.2126-2127.
4. Son, C., Hegde, S., Smith, A., Wang, X., and Sasangohar, F., 2020. Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study. *Journal of Medical Internet Research*, 22(9), p.e21279.
5. <https://www.apa.org>.2021. Anxiety. [online] Available at: <https://www.apa.org/topics/anxiety> [Accessed 9 April 2021].
6. Medscape.com. 2021. According to the DSM-5, which diagnoses are classified as anxiety disorders?.[online] Available at: <https://www.medscape.com/answers/28622714511/according-to-the-dsm-5-which-diagnoses-are-classified-as-anxiety-disorders> [Accessed 9 April 2021].
7. Psychiatry.org.2021. What Is Depression? [online] Available at: <https://www.psychiatry.org/patientsfamilies/depression/what-is-depression?Ga=1.168853089.1797803160.1482157834>



- [Accessed 9 April 2021]
8. Psychology Tools. 2021. Psychological Assessment Scales and Measures | Psychology Tools. [online]Available at: <https://www.psychologytools.com/download-scales-andmeasures/> [Accessed 9 April 2021].
 9. Shah, T. and Pol, T., 2020. Prevalence of depression and anxiety in the general population. *Journal of Mental Health and Human Behavior*, 25(1), p.10. Kutash, K., Duchnowski, A. and Green, A., 2011.
 10. . Nimh.nih.gov. 2021. NIMH » Depression. [online] Available at: <<https://www.nimh.nih.gov/health/publications/depression/index.shtml>> [Accessed 11 April 2021].
 11. Cao, Wenjun, et al. "The Psychological Impact of the COVID-19 Epidemic on the general population in China." *Psychiatry Research*, Elsevier, 20 Mar. 2020, www.sciencedirect.com/science/article/pii/S0165178120305400.
 12. Biswas, S., & Biswas, A. (2021). Anxiety level among the general public of different rural and urban areas in India during lockdown in connection to the COVID-19 pandemic. *Journal Of Public Health*. DOI: 10.1007/s10389-020-01431-8
 13. ChunFengXiao: A Novel Approach of Consultation on 2019 Novel Coronavirus (COVID-19)-Related Psychological and Mental Problems: Structured Letter Therapy <https://doi.org/10.30773/pi.2020.0047>
 14. Islam M.A, Baran SD, Raihan H, Khan M. NA, Hossain M.T (2020) Depression and anxiety among the public during the COVID-19 pandemic in Bangladesh: A web-based cross-sectional survey. *PLoS ONE* 15(8): e0238162.
 15. Biao Tang, Nicola Luigi Bragazzi, Qian Li, Sanyi Tang, Yanni Xiao, JianhongWu: An updated estimation of the risk of transmission of the novel coronavirus (2019-Nov), Volume 5,2020, Pages 248-255, ISSN 2468-0427 <https://doi.org/10.1016/j.idm.2020.02.001>
 16. Irawan, Andi&Dwisona, Dwisona& Lestari, Mardi. (2020). Psychological Impacts of Students on Online Learning During the Pandemic COVID-19. *KONSELI: JurnalBimbinganandanKonseling (E-Journal)*. DOI:[10.24042/kons.v7i1.6389](https://doi.org/10.24042/kons.v7i1.6389).
 17. Worley, T. R., &Mucci-Ferris, M. *College students' mental well-being during the COVID-19 pandemic: The role of relational turbulence and social support processes in relationships with parents*. <https://covid-19.ssri.psu.edu/articles/social-support-and-mentalhealth-during-covid-19>.

