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Nutritional Status of Selected Population of Raipur City during COVID-19 based on BMI: A survey

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ABSTRACT

In late 2019, the outbreak of novel infection coronavirus (SARS CoV-2) which became global pandemic and called as coronavirus disease (Covid-19) World Health Organization (WHO), The 2019 Coronavirus Disease or as it is now called COVID-19, is a severe acute respiratory syndrome caused by SARS Corona Virus (SARS-COV-2). How covid-19 affect the Nutritional status of people. Aim: Our study aimed to investigate the Nutritional status of selected population of Raipur City during COVID-19. Method: The present study was cross-sectional descriptive survey. A validated schedule tool use to assess the Nutritional status of selected population of Raipur city during COVID-19. Sample Size: In this present study research used 1000 sample size to collect data. Sample Area: In this present study research select Raipur city to collect data. Tools for data collection: Schedule, GPS TEST APP digital, weighing machine, Inch tape. Procedure: For this present study researcher used GPS TEST App for tracking sample. With help of GPS Test collect data for survey, then filled up the schedule tool. Result: All 1000 samples responded to the schedule. Researcher carried out the results based on Anthropometric measurement. BMI based on selected population of Raipur City, results shows that Underweight (<18.5 kg/m^2) 33.5% (n=335), Normal weight (18.5-24.9 kg/m^2) 59.6 (n=596), Overweight (25.0-29.9 kg/m^2) 4.1% (n=41), Obesity Class 1 (30-34.9 kg/m^2) 1.6% (n=16), Obesity Class 2 (35-39.9 kg/m^2) None, Obesity Class 3 (> 40 kg/m^2) 1.2% (n=12) Total – 1000 (100.0%). Categories of BMI based on Gender (Male and Female) Underweight (<18.5 kg/m^2) Numbers of male 147(43.9%*) (33.9**) Number of female 188(56.1%*) (33.2%**) total number of male and female are underweight 335*. Normal weight (18.5-24.9 kg/m^2) Number of males 259 (43.5%) (59.9**) Number of Female 337 (56.5%*) (59.4%**) total number of males and females 596*. Overweight (25.0-29.9 kg/m^2) number of males 14(34.1%*) (3.2%**) number of females 27 (65.9%*) (4.8**) total number of males and females 41*. Obesity Class 1(30-34.9 kg/m^2) Number of males 06 (37.5%*) 1.4%*, Number of female 10 (62.5%*) (1.8%**) total Number of males and Females 16*. Obesity Class 3 (> 40 kg/m^2) number of males 07(58.3%*) (1.6%**) number of females 05 (41.7%*) (0.8%**) total number of males and females 12*. Total Number of population males (433**) and Females (567**) =1000. Conclusion: During COVID-19 widespread consequences, people become sensitive to the emotional impact of COVID-19 infection. Despite the fact that most nations have placed restrictions on social activities, people sought out to different activities like yoga, meditation, gym and other hobbies to keep themselves occupied while most of them chose to accept the situation.

Key words: Nutritional status, Pandemic, Coronavirus (COVID-19), WHO, Raipur city, GPS Test app

INTRODUCTION

In India it was supposed that in December 2019, WHO declared COVID-9 a global health emergency due to the exponential growth of cases in China and other countries of the world. The 2019 Coronavirus Disease or as it is now called COVID-19, is a severe acute respiratory syndrome caused by SARS Corona Virus (SARS-COV-2). COVID-19 apparently transit from animals to humans at the Human seafood market and rapidly spread from Wuhan city of Hubei province of china, to the rest of the world. Due to growing case

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notification rates in international locations, on the 30th January 2020, the WHO Emergency committee declared a global health emergency. After COVID-19 emerged some of our thoughts and behaviours around eating do appear changed. Since the pandemic outbreaks people plan to eat more healthy (Kumar *et al.,* 2020; Ming *et al.,* 2020; Mukeshbhai, 2020; Srinidhi *et al.,* 2021 and Stefan *et al.,* 2021). How Nutritional status affect by the variables (Gender, Age Group, study group) which might also contribute to changes in anthropometric measurements.

METHODOLOGY

This is a cross- sectional descriptive study based on a self-administered schedule. This Self-administered schedule was addressed to the Raipur (C.G.) population (Over 18 years of age). In this study total 1000 respondents were included (based on theirs work group). The study comprised a structural schedule Annexure that inquired demographic Information(Name, Age, Gender, Education ,Occupation, Family Income, Family Type, Family Member, House, Type of House) Anthropometric Measurements (Height, Weight, BMI, Circumference of waist, Circumference of Hip, WHR), Physical Examination (Eyes, Teeth, Gums, Skin, Hair, Nails, Lips) physical health problem(constipation, sugar, B.P Stomach-ache, Joint-pain, Deficiency of Vitamin-D, Deficiency of calcium, amoebiasis) Mental health problem (depression, stress, fatigue) dietary management (vegetarian, Non-vegetarian, Eggetarian, Jainy food, food frequency- once in a day, twice in a day, thrice in a day, and fourth times in a day, 24 hours recall) lifestyle habits (smoking habits- before and after lock down, sleep pattern- before and after lockdown, physical activity – before and after lockdown). The survey was conducted from the 9 January 2022 to 21 July 2022. This survey was conducted in Raipur city with help of GPS test Device. Present survey was conducted in totally agreement with ethical regulation. All participants were totally aware about the study requirements and were required to accept the data sharing and privacy consent form. Data are represented as a number and percentage in parentheses (%) for categorical variables or median.

RESULTS AND DISCUSSION

A total number of 1000 respondents have been included in the study, age between 18 to 70 years (Male and Females). The nutritional status of the study group based on participants BMI, Gender based BMI, Based on age group.

A perusal of Table 1 revealed that the majority of the selected subjects during Covid-19 maintained their weight (59.6) according to BMI norms i.e. normal weight category with BMI between 18.5-24.9 kg/m^2 ($p<.01$). It was noticeable that 33.5% of subjects were underweight when screened during Covid-19 while 4.1% were overweight, while 1.6% and 1.2% subjects were obese with class I and class III level obesity. Thereby it shows that about 40.4% had weight problems and denotes nutritional, lifestyle and other problems during Covid-19. Table 1 summarises the distribution of selected subjects of Raipur city during COVID-19 based on body mass index and gender.

Table 1 summarises the distribution of selected subjects of Raipur city during COVID-19 based on body mass index and age groups.

Table 1 : Weight Status of Subjects Based on BMI Categories

Categories of BMI	Number	Percentage (%)
Underweight (<18.5 kg/m^2)	335	33.5
Normal weight (18.5-24.9 kg/m^2)	596	59.6
Overweight (25.0-29.9 kg/m^2)	41	4.1
Obesity Class 1 (30-34.9 kg/m^2)	16	1.6
Obesity Class 2 (35-39.9 kg/m^2)	-	-
Obesity Class 3 (> 40 kg/m^2)	12	1.2
Total	1000	100.0
$\chi 2 = 1347.65$, $p<.01$		

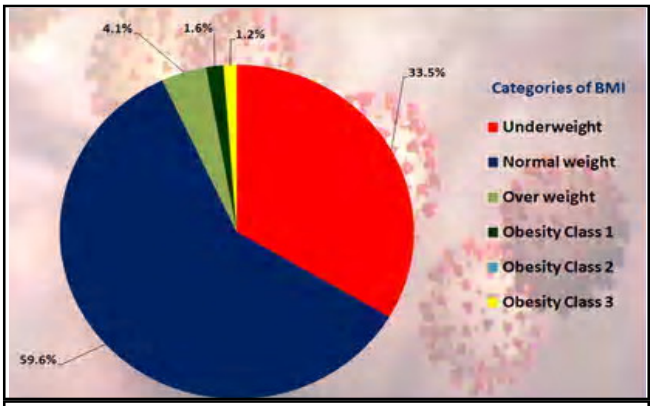

Fig. 1 : Percentage Distribution of Subjects Based on BMI

Table 2 : Weight Status of Subjects Based on BMI Categories and Gender

BMI Categories	Male Subjects		Female Subjects		Total N
	N	%	N	%	
Underweight (<18.5 kg/m^2)	147	43.9%*	188	56.1%*	335*
		33.9**		33.2%**	
Normal weight	259	43.5%	337	56.5%*	596*
(18.5-24.9 kg/m^2)		59.9**		59.4%**	
Overweight	14	34.1%*	27	65.9%*	41*
(25.0-29.9 kg/m^2)		3.2%**		4.8**	
Obesity Class 1	06	37.5%*	10	62.5%*	16*
(30-34.9 kg/m^2)		1.4%*		1.8%**	
Obesity Class 2	0	0	0	0	0*
(35-39.9 kg/m^2)					
Obesity Class 3	07	58.3%*	05	41.7%*	12*
(> 40 kg/m^2)		1.6%**		0.8%**	
Total N		433**		567**	1000
$\chi 2 = 2.77$, p>.05					

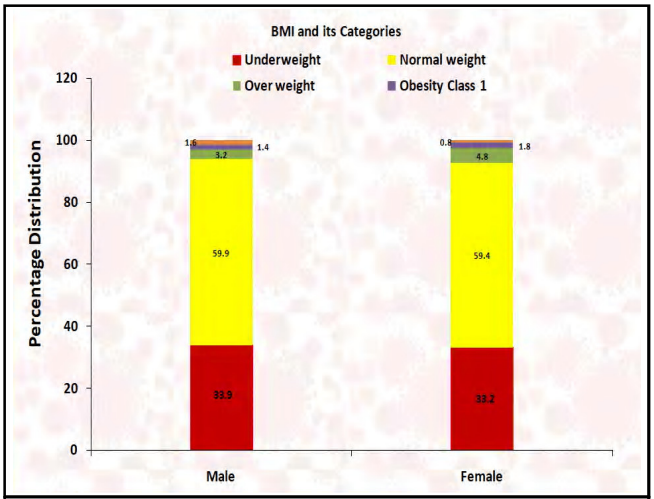

Fig. 2 : Percentage Distribution of Subjects Based on BMI Categories and Gender

A perusal of Table 2 shows that a total of 335 subjects were underweight out of which 43.9% were males and 56.1% were females. The basic mathematical figures also reported that there were 596 subjects with normal weight status and out of which 43.5% were males and 56.5% were females. Hence percentage of underweight females during Covid-19 was higher than males but in contrast percentage of females with normal weight was higher than that of males. Only 69 subjects (27 males and 32 females) in constitute 6.9% were either overweight or obese. Out of 41 subjects identified as overweight, 65.9% were females whereas 34.1% were males. 16 subjects were identified in the obesity class 1 category in which 62.5% were females whereas 37.5% were males. No subject was classified in Obesity Class 2 group. 12 subjects were identified in the obesity class 3 category in which 58.3% were females whereas 41.7% were males.

When analysed different it was found that overall 33.9% of males and 33.2% of females were underweight, and 59.8% of males and 59.4% were placed in the normal weight category. 3.2% and 4.8% of males and females were overweight whereas 1.4% of males and 1.8% of females were classified as obese (class I). In class 3 obesity, 1.6% of males and 0.9% of females fulfil the criteria. The reported p>.05 indicates that the distribution of subjects based on BMI and gender is not significantly different.

Discussion:

Normal weight status is good sign of health. During COVID-19 as per WHO and ICMR guidance population ate balance diet and they maintain their routine to be boost their immune system to fight COVID-19.

According to National Family health survey -05 (year 2019-2021) nutritional status of women in India from Urban residence 9.7% were below height 145 cm carried out. (n=219151) and mean of BMI were 23.6. There is 53.5% women were carried out normal, 13.3% women were carried out thin, between 17.0 to 18.4, 7.6% women were carried out mildly thin, <17.0 moderately/ severely thin, 33.3% women were overweight or obese, 22.9% women were overweight and 10.4% women were obese. Total obese women were 210653 carried out (Table 3).

Table 3 : Nutritional status of women according NFHS-05

Residence	Height, percentage below 145cm	Number of Women	Mean BMI	18.5-24.9 (Normal)	≥18.5 Total Thin	17.0-18.4	≤17.0 Moderate Lit/ Severely Thin	≥25.0 overweight or Obese	25.0-29.9 Overweight	≥30.0 Obese	Number of Women
Urban	9.7	219.151	23.6	53.5	13.3	7.6	5.6	33.3	22.9	10.4	210,653

Note: percentage of women age 15-49 below 145cm, mean body mass Index (BMI), and percentage with specific BMI levels, by background characteristics, India 2019-2021.

Table 4 : Nutritional status of Men according NFHS-05

Residence	Mean BMI	18.5-24.9 (Normal)	≥18.5 Total Thin	17.0 - 18.4	≤17.0 Moderate Lit/ severely thin	≥25.0 Overweight or Obese	25.0-29.9 Overweight	≥30.0 Obese	Number of Men
Urban	23.2	57.1	13.0	7.5	5.5	29.8	23.8	6.0	29.126

Note: percentage of men age 15-49 below 145cm, mean body mass index(BMI), and percentage with specific BMI levels, by background characteristics, India 2019-2021.

Table 5 : Nutritional status of adults according NFHS-05

Nutritional status of adults (15-49years)	Urban residence
Women whose Body Mass Index (BMI) is below normal (BMI≤18.5 kg/m^2) 21(%)	16.0
Men whose Body Mass Index (BMI) is below normal (BMI≤18.5 kg/m^2)21(%)	11.1
Women who are overweight or obese (BMI≥25.0 kg/m^2)(%)	23.1
Men who are overweight or obese (BMI≥25.0 kg/m^2)(%)	22.4

According to National Family Health Survey – 05 (year 2015-2021), Nutritional Status of men in India from urban residence. Mean of BMI 23.2% carried out. 57.1% men were carried out normal, 13.0% were carried out thin ≤ 18.5, 7.5% were carried out mildly thin (17.0-18.4), 5.5% were carried out moderately/severely thin (≤17), 29.8% were carried out overweight (725.0), 23.8% were carried out overweight, 6.0% were carried out were carried obese (≥30.0) total number of men 29,126 (Table 4).

According to NFHS-05 Chhattisgarh, Nutritional status of men and women of Chhattisgarh. In urban residence 16.0% female carried out normal and 11.1% men were normal. 23.1% women carried out overweight or obese or obese and 22.4% men overweight and obese (Table 5).

According to present, survey nutritional status of Raipur city population. 43.5% men were underweight and 56.1% female were carried underweight. 43.5% male were in normal weight and 56.6% female were in normal weight. 34% were carried out overweight and 65.9% female carried out overweight 37.5% men carried out obesity class-I and 62.5% female carried out obesity class-I. 58.3% male carried out obesity class-III and 41.7% female carried out obesity class-III.

Limitation of the study:

Since it was cross- sectional descriptive study based on a self-administered schedule. In addition, the study was limited to the Raipur city, which may not be representative of the rural area, literate and illiterate people can participated without any hesitations.

Conclusion:

This present study showed that Nutritional status of selected population of Raipur city during COVID-19. How covid-19 effect Raipur people BMI. COVID-19 had led the world to its knees. Meanwhile the entire world is struggling to discontinue the chain reaction of COVID-19, and also to optimize its growing burden, it is imperative to keep balance in our weight status. There is a dire need for monitoring and counselling for the population, during COVID-19. Such measure force changes in lifestyle, which may lead to changes in body weight. Normal weight individuals may not normally be troubled by overweight or obesity and may have less awareness of weight gain than people with BMI≥24. Therefore, normal weight as well as overweight and obese people should be aware of the need for weight control when physical activity is necessarily reduced by epidemic prevention and control measure.

Abbreviations:

WHO: World Health Organization, BMI: Body Mass Index

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Availability of data and materials:

The data sets of this article are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate:

Ethical approval for this study was provided by the Human Research for institutional Ethics Committee (IEC), School of studies in life Science, Pt. Ravi Shankar Shukla University Raipur. The study was conducted according to the guidelines laid down in the ethics and all procedures involving participants were conducted after obtaining agreement.

Consent for publication:

Not applicable

Competing interests:

The authors declare that they have no competing interests.

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