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ASSESSMENT OF QUALITY OF LIFE WITH BODY WEIGHT AND LIFESTYLE PARAMETERS AMONG ADULTS DURING FIRST WAVE OF COVID-19 PANDEMIC

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ABSTRACT

Objective: Quality of life and Body Mass Index is an important aspect which determines the health status. Assessing the Quality of life and its association with BMI; selected demographics and lifestyle parameters among male and female adults during covid-19 lockdown was the aim and purpose of the study. **Study design:** This comparative cross sectional study was conducted during the month of July 2020 through online using standardized questionnaire among 327 adults residing in Tamil Nadu. Among the selected samples 165 were female and 162 were male. The structured questionnaire included *Section A*- socio-demographic variables such as age, gender, occupation, educational qualification, place of residence, marital status and lifestyle variables such as type of diet and physical activity pattern; *Section B* - anthropometric variables such as height, weight and BMI; *Section C* - consisted of Standardized WHO-BREF tool to assess the quality of life. **Results:** The results on overall QOL showed that 79.6% of male had good quality of life, whereas in female, 70.3% had good quality of life with no significant difference between the genders ($p=0.209$). Only, Psychological domain ($p=0.012$) showed significant difference at 5% significant level among male and female. Demographics such as place of residence ($p=0.001$), occupation ($p=0.000$) and marital status ($p=0.022$) showed significant association with Quality of Life among the respondents. Lifestyle parameters such as type of diet ($p=0.157$) and physical activity pattern ($p=0.551$) with quality of life showed no significant association. Though the anthropometric variable, BMI showed high significant difference ($p=0.006$) at 1% level between the genders with BMI mean value (26.67) higher in male than female (25.34) there was no significant association with Quality of Life among male ($p=0.113$) and female respondents ($p=0.249$). **Conclusion:** This study finding suggests that the health status of the adults showed that women needed more psychological support than men during pandemic crisis and majority of the respondents showed Obese I category of BMI which indicates that health pandemic impacted the obesity epidemic to a greater extent.

Key Words: COVID-19, Quality of Life, Male, Female; Body Mass Index, WHOQOL BREF, Health Status

INTRODUCTION:

Health is not just the absence of disease or infirmity; it is a complete state of physical, mental and social well-being of individuals (World Health Organization, 2014). An unexplained lower respiratory infection COVID-19 was detected in Wuhan, Hubei province, China on 31st December, 2019 (1). In India, 1.3 billion people were at approximate risk of SARS-CoV-2, which prompted strategies at National and State level with 'containment' mapping (2). The first reported COVID-19 case in India was on 30th of January 2020 (3). Covid-19 was declared as pandemic by World Health Organization on March 11, 2020, which had disrupted the normal life and health status of every individual all over the world (4). Tamil Nadu from South India, has largest health care workforces which prompted COVID-19, SARS-CoV-2 testing for individuals seeking patient care for acute respiratory illness or influenza at health centre for early detection of the positive cases followed with quarantine process and thereby mapping of "containment zones" within 5-km zone of the infected individuals who were in primary contact with the susceptible COVID-19 positive patients (5). Tamil Nadu further instituted temperature and clinical screening at boundaries with other states on 4 March 2020. Tamil Nadu and Andhra Pradesh each recorded their first laboratory-confirmed COVID-19 cases on 5th March 2020. An age- specific COVID-19 mortality rate was lower in Tamil Nadu with relatively lower incidence of disease at the oldest

age (6). Globally the mortality case of COVID-19 was 2, 48, 780, with the number of confirmed cases being 35, 85 , 711 as of 4 May 2020 (7). Tamil Nadu recorded highest Covid-19 cases (42,752) during the month of June 2020. Chennai with highest 1487 positive cases of Covid-19 along with other non-hotspots districts reported were 126 in Chengalpaatu, 56 in Kancheepuram, 120 in Tiruvallur, 63 in Cuddalore, 139 in Tiruvannamalai, 157 in Madurai, 62 in Thoothukudi with minimal effect in Nammakal and Perambalur districts of One each. Districts like Kancheepuram, Chennai, Chenagalpattu, Madurai and Tiruvallur accounted for about 63.5% of the State's total cases (8). Government of all the countries ordered 'Lockdown' as a foremost non-pharmacological preventive measure in reducing the transmission of infection due to lower flow of trade and transportation (9). On June 5, 2020, World Health Organization conceded the use of face masks by people of all age groups as a protective measure (10). Pandemic disrupted the quality of life and health services in the entire region of Tamil Nadu, which further disturbed the economic and social development; maintaining good-health during pandemic is essential and vital to the lives of every single person in the community. The most prevalent co-morbid conditions identified during the pandemic were diabetes (45.0%), sustained hypertension (36.2%), coronary artery disease (12.3%) and renal disease (8.2%) among older population (11). In

addition to the increased infection rate, people from lower- income and middle-income gradient of socio-economic level also faced financial, mental and physical health crisis during this pandemic; Apart from COVID-19 pandemic, Obesity had become an epidemic health problem in both developed and developing countries of the 21st century (12, 13). A report from the World Obesity Federation states that higher BMI of more than 30 and 34 showed increased risks of COVID-19 complications among adults (14). Studies states that Obesity and Over-weight increases the mortality rate of co-morbid conditions such as diabetes (47 %), ischemic heart diseases (24 %) and cancers (9- 43 %) (15). Mortality rate from COVID-19 had increased ten times in countries where Obesity affected half of the population (16). Obesity in urbanized cities like Chennai, accounts for about 39% with incidence of about 32% in Hyderabad and 46% in Bangalore among adults; while, childhood obesity was found to be higher in boys (21.8 %) than girls (17.4 %) (17). Lifestyle changes through the use of processed foods, alcohol, sedentary activity, reduced outdoor exercises with increased entertainments through electronic media prompts increased skin-fold thickness and BMI (18). BMI is the most widely used method to gauge obesity which is equal to $\text{weight}/\text{height}^2$ (kg/m^2) and it is one of the standard method in relating body weight to the height of adults. Since the increased BMI is evidently associated with higher complications of COVID-19, this present study aimed to assess the quality of life with BMI along with selected demographic details and lifestyle

pattern among male and female during Covid-19 lockdown.

MATERIALS AND METHODS:

Study design and Population:

This comparative cross sectional quantitative study was conducted during the month of July 2020 to assess the quality of life and its association with body mass index, selected socio-demographic variables and lifestyle variables during Covid-19 lockdown among male and female in Tamil Nadu, India. The study participants were individuals residing in different regions of Tamil Nadu like Chennai, Chengalpaatu, Kanchipuram, Madurai, Trichy, Tuticorin, Thiruvanamalai and Thiruvallur districts. After informing the purpose of the study and obtaining informed consent in the Google platform, standardized structured questionnaire was circulated through online to 330 potential willing respondents between 18 to 45 years of age and above; among them 327 responded in this survey which included 165 female and 162 male. A structured questionnaire included 3 sections namely *Section A* included socio-demographic variables such as age, gender, place of residence, educational qualification, occupation marital status and lifestyle variables such as type of diet and physical activity pattern; *Section B* included anthropometric variables such as height, weight, BMI and *Section C* consisted of Standardized WHO-BREF tool questionnaire to assess the quality of life of the subjects (19). Prior permission (ID number 351578) was obtained from World Health Organization for using WHOQOL-BREF tool. WHOQOL BREF tool consisted of 26

questions which are divided into four domains: Physical health domain (7 items), Psychological health domain (6 items), Social relationship (3 items) and Environmental domain (8 items) along with two items for determining the overall Quality of Life (QOL). Scoring for each question was done using 5- point Likert scale with a higher score indicating good QOL except for the negative questions (20) and QOL was classified as poor (0-33.3%), average (33.3 – 66.7%), and good (more than 66.7%) based on the obtained scores (21). Anthropometric variable, BMI was calculated using formula:[weight (kg)/ height (m ²)] and was categorized based on WHO Obesity Asian classification as underweight (less than 18.5), normal (18.5-24.9), overweight (25.0-29.9), Obesity I (30.0-34.9), Obesity II (35.0-39.9) and extreme obesity (greater than 40) (22).

Data Management and Analysis:

Data was tabulated in an Excel sheet. Frequency and percentage distribution were used to analyze categorical

variables. Quality scores were calculated based on the measure of participant's response towards the four domains of WHOQOL BREF tool. The Chi-square test was used in finding the association between Quality of life scores and categorical variables. Independent t-test was used to analyze the comparison between quality of life scores between the genders. All tests were statistically measured at 5 % level of significance.

RESULTS AND DISCUSSION:

Demographic characteristics:

The demographic characteristics of the respondents are presented in Table 1. The majority of the participants were aged between 26-33 years (31.8%); with the least participants belonged to above 50 years of age (6.7%). Among the samples 50.5% of the participants were women and 49.5 % were men.

Table 1: Demographic Characteristics

S. No.	Demographic Variable	Class	No. of respondents	Percentage
1	Gender	Female	165	50.5%
		Male	162	49.5%
2	Age (in years)	18-25	57	17.4%
		26-33	104	31.8%
		34-41	102	31.2%
		42-49	42	12.8%
		above 50	22	6.7%
3	Place of Residence	Rural	64	19.6%
		Semi-urban	89	27.2%
		Urban	174	53.2%
4	Educational Qualification	Master Degree	220	67.3%
		Degree	74	22.6%
		Diploma	6	1.8%
		High School	12	3.7%
		Other	15	4.6%
5	Occupation	Government Sector	73	22.3%
		Private Sector	142	43.4%
		Self Employed	37	11.3%
		Home-maker	24	7.3%
		Student	51	15.6%
6	Marital Status	Single	115	35.2%
		Married	211	64.5%
		Separated	1	0.3%

The place of residence of the participants recorded was Urban (53.2%) followed by Semi-urban (27.2 %) and Rural (19.6%). About 67.3% of the participants held Post-graduate degree while 22.6 % were Under-graduates. The occupation of the respondents showed that 43.4% were in Private sector followed by 22.3 % in

Government sector, 11.3% were Self-employed, 15.6% of the samples were Students and 7.3% were Home-makers. The marital status of the respondents observed was, 64.5 % married followed by 35.2 % being single and 0.3 % belonged to separated relationship.

Anthropometric Characteristics:

Table 2: Anthropometric Characteristics

S. No.	Anthropometric Characteristics	Class	No. of respondents	Percentage
1	Height (in Cms)	< 151 Cms	26	8.0%
		151 - 165 Cms	155	47.4%
		166 - 180 Cms	139	42.5%
		> 180 Cms	7	2.1%
2	Weight (in Kgs)	Upto 50 Kgs	24	7.3%
		51 - 65 Kgs	99	30.3%
		66 - 80 Kgs	136	41.6%
		> 80 Kgs	68	20.8%
3	BMI	Underweight	15	4.6%
		Normal range	60	18.3%
		Overweight	54	16.5%
		Obese I	161	49.2%
		Obese II	37	11.3%

Fig.1 BMI distribution among the respondents

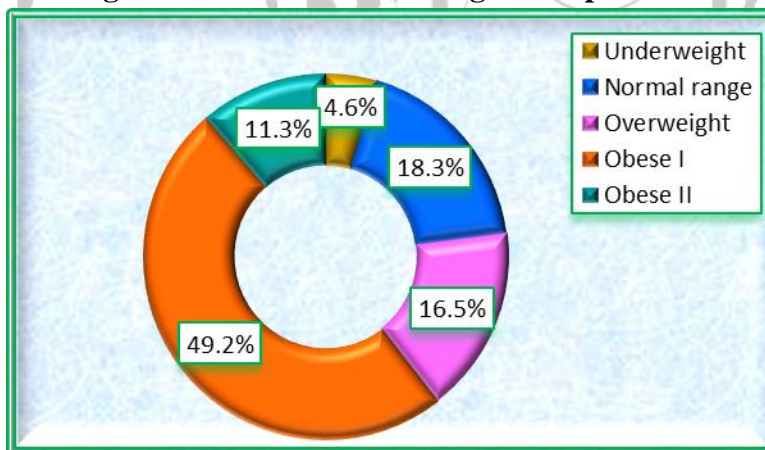


Table 2 and Fig.1 depicts the Anthropometric Characteristics. Majority of the respondents, 49.2% belonged to Obese I range of BMI, 16.5% were Overweight, 11.3% belonged to Obese II range, 18.3% had Normal BMI and 4.6% were found to be Underweight.

Table 3 -Lifestyle variables

S. No.	Lifestyle Characteristics	Class	No. of respondents	Percentage
1	Type of Diet	Vegetarian	70	21.4%
		Non-Vegetarian	257	78.6%
2	Physical activity pattern	Walking	150	45.9%
		Jogging	29	8.9%
		Yoga	30	9.2%
		Indoor Workouts	69	21.1%
		Walking & Jogging	5	1.5%
		Walking & Yoga	16	4.9%
		Walking & workout	11	3.4%
		Jogging & workout	1	0.3%
		Yoga & workout	2	0.6%
		Walking, Jogging & Yoga	3	0.9%
		Walking, Jogging & workout	3	0.9%
		Walking, Yoga & workout	2	0.6%
		Walking, Jogging, Yoga & workout	6	1.8%

Lifestyle variable:

Majority of the respondents were non-vegetarian-78.6% while (21.4%) were vegetarian. Walking (45.9%) was found to be the major type of physical activity pattern recorded by the respondents followed by Indoor workouts (21.1%).

Quality of Life:

Table 4 and Fig.2, illustrates the overall quality of life among the samples. It was observed that 74.9% had 'good' QOL, while 25.1% had 'average' QOL none of the participants had 'poor' quality of life,

Table 4-Overall Quality of Life

S. No.	Level of Quality of Life	No. of respondents	Percentage
1	Poor	0	0.0%
2	Average	82	25.1%
3	Good	245	74.9%

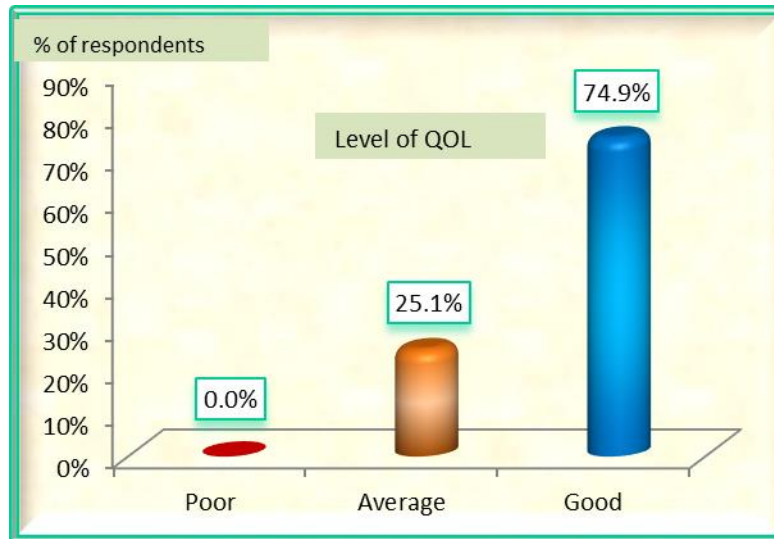


Fig.2. Percentage distribution of Overall Quality of Life

Table 5-Association between the Quality of life with demographic variables; anthropometric variables and lifestyle characteristics of the respondents (Chi-Square test)

S. No.	Variables	Class	Quality of Life		Chi-Square Value	DF	P Value
			Average	Good			
	Demographics						
1	Gender	Female	49	116	3.785	1	0.052
		Male	33	129			
2	Age (in years)	18-25	22	35	9.034	4	0.060
		26-33	25	79			
		34-41	20	82			
		42-49	12	30			
		above 50	3	19			
3	Place of Residence	Rural	23	41	14.097	2	0.001**
		Semi-urban	30	59			
		Urban	29	145			
4	Educational Qualification	Master Degree	54	166	8.446	4	0.077
		Degree	18	56			
		Diploma	1	5			
		High School	7	5			
		Other	2	13			
5	Occupation	Government Sector	5	68	25.839	4	0.000**
		Private Sector	39	103			
		Self Employed	7	30			
		Home-maker	8	16			
		Student	23	28			
6	Marital Status	Single	39	76	7.592	2	0.022*
		Married	43	168			
		Separated	0	1			
	Anthropometrics						

7	Height (in Cms)	< 151 Cms	6	20	2.705	3	0.439
		151 - 165 Cms	45	110			
		166 - 180 Cms	29	110			
		> 180 Cms	2	5			
8	Weight (in Kgs)	Upto 50 Kgs	6	18	3.449	3	0.327
		51 - 65 Kgs	26	73			
		66 - 80 Kgs	28	108			
		> 80 Kgs	22	46			
9	BMI	Underweight	5	10	8.329	4	0.080
		Normal range	14	46			
		Overweight	12	42			
		Obese I	35	126			
		Obese II	16	21			
	Lifestyle						
10	Type of Diet	Vegetarian	13	57	2.006	1	0.157
		Non-Vegetarian	69	188			
11	Physical activity pattern	Walking	43	107	10.746	12	0.551
		Jogging	5	24			
		Yoga	6	24			
		Indoor Workouts	20	49			
		Walking & Jogging	0	5			
		Walking & Yoga	5	11			
		Walking & workout	0	11			
		Jogging & workout	0	1			
		Yoga & workout	0	2			
		Walking, Jogging & Yoga	1	2			
		Walking, Jogging & workout	1	2			
		Walking, Yoga & workout	0	2			
		Walking, Jogging, Yoga & workout	1	5			

* - Significant at 5% level ** - Significant at 1% level

From the table-5, it was evident that demographic variables such as 'place of residence' (p=0.001**) and 'occupation' (p=0.000**) showed high significant level of association with the quality of life (QOL) among the participants at 1% level of significance. The 'marital status' of the respondents also showed significant association (p=0.022*) with QOL at 5 % level of significance. There was no significant association between QOL of the

respondents with anthropometric variables (height, weight and BMI) and lifestyle variables (type of diet and physical activity pattern).

Quality of Life and Body Mass Index among male and female respondents

Table 6, represents that there was no significant association between Quality of life and the Body Mass Index level among male (p=0.113) and female (p=0.249) respondents.

Table 6-Association between BMI and the Quality of Life (QOL) of male and female respondents

S. No.	Gender	Level of BMI	Quality of Life		Chi-Square Value	DF	P Value
			Average	Good			
1	Male	Underweight	0	4	7.476	4	0.113
		Normal range	5	16			
		Overweight	3	24			
		Obese I	17	73			
		Obese II	8	12			
2	Female	Underweight	5	6	5.394	4	0.249
		Normal range	9	30			
		Overweight	9	18			
		Obese I	18	53			
		Obese II	8	9			

* - Significant at 5% level ** - Significant at 1% level

Quality of Life between male and female respondents:

Table -7 illustrates that though the overall QOL mean value of the male participants (88.66) was higher than the female participants (86.96) , there was no significant difference (p=0.209) in their QOL between the genders.

Table-7 Comparison between the Quality of Life between male and female (Independent t test)

S. No.	Gender	N	Mean	SD	t value	DF	P value
1	Female	165	86.96	12.715	-1.259	325	0.209
2	Male	162	88.66	11.617			

* - Significant at 5% level ** - Significant at 1% level

Domain wise Quality of life between male and female:

Table 8, represents that there was significant difference between the genders in Psychological domain (p=0.012) at 5 % level of significance. Though there was no

significant difference in Physical Health domain (p=0.396); Social domain (p=0.780) and Environmental domain (p=0.965) their mean score value was found to be higher among male than female.

Table-8 Comparison between the Quality of Life (domain wise) based on gender (Independent t test)

S. No.	Domain	Gender	N	Mean	SD	DF	T value	P value
1	Physical Health Domain	Female	165	26.4606	4.21741	325	-0.850	0.396
		Male	162	26.8272	3.54664			
2	Psychological Domain	Female	165	20.897	4.20021	325	-2.518	0.012*
		Male	162	21.9321	3.14875			
3	Social Domain	Female	165	7.6303	1.61254	325	0.426	0.780
		Male	162	7.679	1.54298			
4	Environmental Domain	Female	165	24.7212	4.08684	325	0.813	0.965
		Male	162	24.7407	3.99931			

* - Significant at 5% level

** - Significant at 1% level

DISCUSSION:

The COVID-19 pandemic can be compared with SARS epidemic during 2003 which had a mortality rate of 800 in 26 countries leaving more than 8000 with infection (23). The psychological stability of men and women in facing the COVID-19 pandemic was an important determinant for assessing their Quality of Life in this study. The standardized WHOQOL-BREF tool based on four domains namely Physical Health, Psychological, Social and Environment assessed the Quality of Life parameters among the adults; the mean score of psychological domain was higher in male than female with significant difference, indicating that male had better psychological health than female during COVID-19 pandemic, which implies that women during pandemic faced challenges in maintaining their quality of life, critically than men (24). Women during lockdown had limited control over resources and decision making influence in

household (25). Scaled back accessibility towards reproductive health in health care centre for women during the COVID-19 outbreak could also played a distressing effect as experienced during previous outbreaks like Ebola epidemics and Zika epidemic (26). Working women and female-headed households had to catch up with more responsibility in taking care of the family along with their jobs. Comparison of overall quality of life among the samples showed that, none of the participants had 'poor' level of quality of life, which highlight the positive perception on other side of the lockdown days by spending quality time with the family through work from home option; which ultimately increased the shared and cared support from friends and family members with similar results found in a study conducted in China (27). According to our findings, place of residence, occupation and marital status had significantly affected the QOL of the respondents

during COVID-19 .Socioeconomic status, disability, age, race, geographic location had great influence on the health care services and information about COVID-19 as fragile, which made women of all ages to face critical situation in receiving treatment and health services during Health pandemics (28).

Though there was a difference in BMI value between male and female, it showed no difference between BMI and quality of life significantly. The distribution of mean BMI level showed that majority of the male and female respondents were under the classification of Obese 1 which indicated that various patterns of physical activity were reduced for the adults due to lockdown and infection spread. Similar results was found in the study conducted by **Paivi E. Korhonen et al.**, 2013 (29) that in apparently healthy middle-aged subjects, with increasing level of BMI mental components of Quality of Life do not differ between the categories of BMI in either gender. Worldwide threat of pandemic, impacted highly on the physical activity level, which added dual burden in maintaining the health status among the gender, with a prevalence rate of 2.9 million adults already being in the risk factor of morbid obesity in developing and developed countries (30).

CONCLUSION:

The present study demonstrated significant difference in Psychological domain between male and female which contributes to the evidence that women were challenged with more psychological burden than men during health crisis. The relationship between BMI and QOL was not

significantly associated though the mean BMI was higher for male than female. Vulnerable women population, need additional care during health pandemics by recognizing the health-care burden faced by every woman at individual level in the community.

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SOURCE OF FUNDING:

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COMPLIANCE WITH ETHICAL STANDARDS

CONFLICT OF INTEREST:

The authors declare that there is no conflict of interest for this research study.

ETHICS APPROVAL:

After obtaining prior permission from the concerned department of the SRM Medical College Hospital and Research Centre, Kattankulathur, the present research study was conducted through online. Confidentiality of the participant's data was maintained throughout the research process.

CONSENT TO PARTICIPATE:

Participation in this survey was voluntary and informed consent was given by all the prospective respondents by returning the filled up questionnaire through Google platform.

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