

A Study to Assess the Determinants of Quality of Life among Adults during Covid-19 Pandemic in South India

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ABSTRACT

Background: Quality of life (QOL) is an important determinant in assessing the health status. It includes physical, psychological, and social well being. The aim of this research was to identify the intrinsic and extrinsic factors of QOL; and the association of QOL with socio-demographic, anthropometric variables and lifestyle variables. **Methods:** This cross sectional study was conducted in Tamil Nadu among 327 adults during July 2020 through online using standardized WHOQOL-BREF tool to assess the quality of life along with socio-demographic variables, anthropometric variables and lifestyle variables. Principal component analysis method was used to identify the factors which influence the QOL of adults. The association between socio-demographic variables, anthropometric variables and lifestyle variables with quality of life was also assessed. 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; *Section B* - anthropometric variables such as height, weight and BMI; *Section C* lifestyle variables such as type of diet and physical activity pattern; and *Section D* - consisted of Standardized WHO-BREF tool to assess the quality of life. **Results:** The identified intrinsic factors include Life style approach, Emotional stability and Health status; Safety & accomplishment, Financial support with societal information were identified as extrinsic factors. These factors played an influential role in QOL of the adults during pandemic crisis. The association between the type of residence ($p=0.001$), occupation ($p=0.000$) and marital status ($p=0.022$) with QOL was highly significant at 1 % and 5 % respectively. **Conclusion:** The identified factors during covid-19 pandemic had influenced the quality of life domains namely physical health, psychological, social relationship and environment. Intrinsic factors were dependent on individual's perception towards accepting the new normal during the pandemic. Whereas, extrinsic factors were greatly influenced by the environment and society in which the study participants were exposed. One of the identified extrinsic factors (residence), showed high significant association with QOL.

Keywords

Quality of Life Status, Physical health, Psychological health, Social, Environment, Factors of QOL, Adults, Covid-19 Pandemic

INTRODUCTION

Quality of life predominantly focuses on physical well being and mental health of individuals in the population [1]. World Health Organization defines QOL as "individuals' perception of their position in life in the context to the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. The World Health Organization Quality of Life: Brief Version (WHOQOL-BREF) assesses Quality of life (QOL) in four domains [2]. The QOL domains such as Physical health domain, Psychological health domain, Social relationship and Environmental domain can be influenced by different intrinsic and extrinsic factors which in turn moulds the health status of the individual [3]. COVID-19 was declared as pandemic by the World Health Organization (WHO) on March 11, 2020[4]. This pandemic had disrupted the normal life and health status of every individual all over world [5]. Tamil Nadu in the southern most part of the Indian sub-continent with 38 districts and was the tenth largest Indian state by area and the sixth largest by population also had received a major gust in Covid-19 cases. Because of the dense population 'lockdown' were relied as the non- pharmacological measure to control the spread of the pandemic in Tamil Nadu. Districts like Chennai, Kancheepuram, Chennai, Chennai,

Tiruvallur and Madurai accounted for about 63.5% of the State's total cases [6]. The adoption of 'new normal' during pandemic and curfew in the society had directly and indirectly affected the economic and social background of every single person in the State and Nation equally [7]. Social economic status (SES) including income, and occupation had certainly influenced the living environment of an individual during the covid-19 pandemic [8]. Lockdown during pandemic, quarantine period and social distancing restricted the physical activity and social communication in fear of contracting the COVID-19 [9]. In fact, during Covid-19 pandemic it would be rationale to assess the intrinsic and extrinsic factors of Quality Of Life and its association with selected socio-demographic, anthropometric and lifestyle variables.

METHOD

This cross sectional descriptive qualitative and quantitative research study was conducted among 327 adults (165 female; 162 male) during the lockdown period in Tamil Nadu using online questionnaire. The participants selected were able to read and write English and with access to online communication through Google platform. After informing the purpose of the study, a structured questionnaire was circulated via google form link to the participants residing in different regions of Tamil Nadu; the structured questionnaire includes *Section A*- socio-demographic variables such as age, gender, occupation, educational qualification, place of residence, marital status; *Section B* - anthropometric variables such as height, weight and BMI; *Section C* lifestyle variables such as type of diet and physical activity pattern; and *Section D* - consisted of Standardized WHO-BREF tool to assess the quality of life [10]. 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 [11] 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 [12]. Association between socio-demographic variables, anthropometric variables and lifestyle variables with quality of life was assessed and factors contributing to the QOL were determined by Principal Component Analysis.

Data Management and Analysis:

Data was tabulated in an Excel sheet. 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. All tests were statistically measured at 5 % level of significance. Principal component analysis method was used to identify the intrinsic and extrinsic factors which may influence the Quality of life among the respondents.

RESULTS AND DISCUSSION

Quality of Life:

WHOQOL-BREF tool consists of four domains namely *Physical health, Psychological, Social relationships and Environment*. Table-1 and Fig.1 illustrates the overall quality of life among the study samples. It was observed that 74.9% had 'good' QOL, while 25.1% had 'average' QOL and none of the participants had 'poor' quality of life during the study time.

Table 1- Respondents distribution to Overall Quality of Life

S. No.	Level of Quality of Life	No. of respondents
1	Poor	0
2	Average	82
3	Good	245

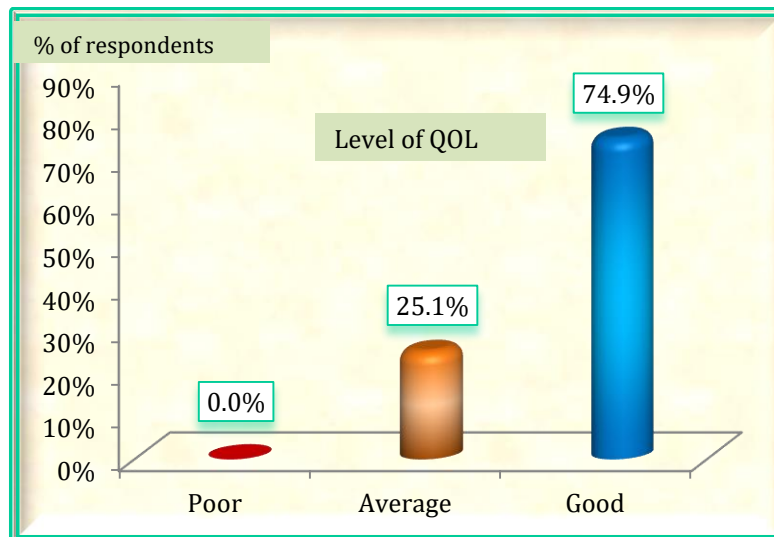


Fig.1. Percentage distribution of Overall Quality of Life

Table 2-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-2, 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).

Exploratory Factor Analysis

Principal Component Analysis:

From Table 3, it is apparent that KMO value is 0.881, which is more than 0.5 [13]. Pallant (2013) states that sampling is adequate if the Kaiser Meyer Olkin (KMO) is 0.6 and above (Kaiser 1970, 1974). Bartlett Test of Sphericity measures a multivariate normality of set of distribution with a significance value of 0.000 which is less than 0.05, which confirms the data adequacy [14].

Table:3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.881
Bartlett's Test of Approx. Chi-Square	2.940
Sphericity df	231
Sig.	.000

The main step for Factor extraction process is the Rotation of principal component [15] as shown in table 4. Principal Component Analysis provided the 6 possible factors existence with 63.8 % of the total cumulative variance.

Table 4 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.593	34.516	34.516	7.593	34.516	34.516	3.953	17.966	17.966
2	1.590	7.228	41.743	1.590	7.228	41.743	2.958	13.443	31.410
3	1.440	6.546	48.289	1.440	6.546	48.289	2.007	9.122	40.532
4	1.232	5.599	53.888	1.232	5.599	53.888	1.928	8.762	49.294
5	1.155	5.250	59.138	1.155	5.250	59.138	1.902	8.644	57.939
6	1.028	4.671	63.809	1.028	4.671	63.809	1.291	5.870	63.809
7	.945	4.297	68.106						
8	.778	3.536	71.641						
9	.701	3.184	74.826						
10	.655	2.976	77.802						
11	.623	2.833	80.634						
12	.549	2.494	83.129						
13	.533	2.422	85.550						
14	.512	2.327	87.877						

15	.485	2.204	90.082						
16	.410	1.865	91.946						
17	.372	1.693	93.639						
18	.332	1.510	95.149						
19	.310	1.411	96.560						
20	.278	1.265	97.825						
21	.267	1.215	99.040						
22	.211	.960	100.000						

Extraction Method: Principal Component Analysis.

The total variance explained here is based on the Eigen value. From the table 4, it was evident that cumulative % for the six factors extracted together were accounting for 63.8% of the variance. This is around the medium distribution of information and around 36.2 % of the information content was from other factors. The higher the Eigen value the higher the amount of variance explained by the factor [16]. Therefore to identify the main variables, only those that had the Eigen value of 1 or more has been retained [17]. Table 4 represents that only 6 factors out of 22 factors have Eigen values greater than 1, which can be extracted for the next stage. Hence we can also state that the 6 factors alone extracted 63.8 % of the total variance .In order to identify the constituents of each factor, rotated component matrix was then analyzed. Table 5 identifies the factors which are strongly associated with the quality of life by Principal Component Analysis (PCA), a rotated component matrix [18].

Table 5 Rotated Component Matrixa

Variables	Component					
	1	2	3	4	5	6
Items of WHOQOL-Bref						
Physical Pain Prevents me doing my work	.037	-.023	.015	.126	.020	.849
Do you need any medical treatment to function in your daily life	.026	.015	-.013	.848	-.014	.191
How well are you able to get along with others	.560	.211	-.064	.293	.330	.129
Do you have enough energy to perform your routine activity	.213	.311	.235	.625	.283	.031
How satisfied are you with your sleep	.467	-.025	.588	.088	.060	-.246
How satisfied are you with your ability to perform your daily living activities	.610	.330	.280	.233	-.022	.333
How satisfied are you with your capacity to work	.478	.454	.128	.277	-.073	.146
How much do you enjoy your life	.203	.484	.637	.100	-.023	-.117
To what extent do you feel your life to be meaningful	.054	.464	.424	.325	.143	-.152
How well are you be able to concentrate in your daily activity	.175	.679	.242	.089	.159	.040
How satisfied are you with yourself	.599	.309	.272	.349	.009	-.023
Are you able to accept your outward appearance	.231	.280	.208	.490	.369	-.271

How often do you have negative feelings such as despair, anxiety and depressions	.058	.082	.734	.037	.247	.303
How satisfied are you with your personal relationship	.676	.186	.258	.154	.215	.028
How satisfied are you with the support you get from your friends	.733	.042	.091	.086	.051	-.201
How safe do you feel in your daily life	.237	.657	.163	.011	.148	.064
How healthy is your physical environment	.285	.719	-.150	.142	.093	.035
Do you have enough money to meet your needs	.149	.106	.248	.148	.772	.148
Do you have the access to vital information which is required to perform your daily life	.224	.271	.002	.024	.784	-.100
To what extent do you have the opportunities for leisure activity	.099	.489	.061	.071	.299	-.189
How satisfied are you with your living conditions	.727	.217	.126	-.049	.251	.072
How satisfied are with your access to health services	.735	.228	-.045	-.101	.130	.032

Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Note. Bold items indicate major factor loadings.

Observing the rotated component matrix, the following statements have acceptable loadings on the following factors. Though 0.7 is considered as an optimum benchmark, values above 0.6 have been taken, and the values below 0.6 had been rejected [19]. The table 6 represents the variable with respective loading from Rotated component Matrix.

Table 6 Labeling of Factors with the WHOQOL- Bref domain

Factor label	Items of WHOQOL-Bref	WHOQOL-Bref domain	Factor loadings
Factor 1 Lifestyle approach	How satisfied are you with your ability to perform your daily living activities	Physical health	.610
	How satisfied are you with your personal relationship	Social relationship	.676
	How satisfied are you with the support you get from your friends	Social relationship	.733
	How satisfied are you with your living conditions	Environment	.727
	How satisfied are with your access to health services	Environment	.735
Factor 2 Safety and	How well are you be able to concentrate in your daily activity	Psychological health	.679

accomplishment	How safe do you feel in your daily life	Environment	.657
Factor 3 Emotional stability	How much do you enjoy your life	Psychological health	.637
	How often do you have negative feelings such as despair, anxiety and depressions	Psychological health	.734
Factor 4 Health status	Do you need any medical treatment to function in your daily life	Physical health	.848
	Do you have enough energy to perform your routine activity	Physical health	.625
Factor 5 Financial support and Societal Information	Do you have enough money to meet your needs	Environment	.772
	Do you have the access to vital information which is required to perform your daily life	Environment	.784
Factor 6	Physical Pain Prevents me doing my work	Physical health	.849

Factor 6 ‘Physical Pain prevents me doing my work’ consist of single contributory statement about the physical health status with a factor loading of **.849**. Since component 6, doesn’t show other factor loadings to the other statements, this single statement may be considered as a determinant in itself. This belongs to the physical health domain of WHOQOL-BREF tool. Of the 5 items sequenced in Factor 1, two belong to the Social relationship domain and the other two belong to Environment domain with a single item in reference to Physical health domain. In factor 2, it had a combination of two domains namely Psychological Health and Environment. Factor 3, was conceptually similar to the original Psychological health domain with two constituent items that defines the domain respectively. It is noteworthy, that the two Physical health domain facets were emerged in Factor 4. Factor 5, defines the Environment domain as it has the original corresponding facets related to the specified domain. Lifestyle approach (factor 1) Emotional stability (factor 3) and Health status (factor 4) can be suggested as Intrinsic factors, since they deal with one’s inner level of Health, Emotional satisfaction and overall well-being towards their daily life. Whereas, Safety & accomplishment (factor 2) and Financial support and Societal Information (factor 4) were recommended as ‘Extrinsic factors’ as the individual depends on safety, job security and accessibility of vital information from the society.

DISCUSSION

The study findings demonstrate the determinants that influence the Quality of Life among adults towards the health outbreak crisis. The identified intrinsic and extrinsic factors focus the psychosocial elements related to the WHOQOL-Bref domain namely physical, psychological, social and environment. The COVID-19 pandemic had vitally disturbed the routine life of every individual across the globe [20]. The association with the type of residence found in this study

was more consistent with the study conducted by Yang Zhang et al., 2012 stating the health and social domains from urban background was significant than those from the rural which define the type of residence has an impact factor in promoting a better QOL among medical students in China. There was a negative economic impact worldwide due to COVID-19 [22]. Results for this study showed occupation was significantly associated with quality of life; since earned individuals can protect themselves from the negative economic balance in the society and maintain their appropriate levels of QoL and psychological health during the COVID-19 pandemic [23, 24]. Similarly, marital status also showed higher significant association with the QOL of the respondents, which displays consistent results to the study conducted by Baryła-Matejczuk, M.et al., 2020. Study conducted by **Paivi E. Korhonen et al.**, 2013 (26) found 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 which was found to be parallel with this study findings that majority of the respondents were found to be in obese I category of BMI with good QOL. Increased BMI also shows the threat of reduced physical activity level which adds the dual burden in maintaining the appropriate body weight due to condensed outdoor and gym workouts during health pandemics.

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 by Yingfei Zhang in China during February 2020.

CONCLUSION

The present study demonstrated significant association with selected socio-demographic variables such as place of residence, occupation and marital status. Besides the reduced physical activity and increased BMI, the Quality of Life during the lockdown period was found to be appropriate with Physical health, Psychological, Social relationship and Environment domain of the standardized WHOQOL-Bref tool. The identified Intrinsic and Extrinsic factors showed higher positive loadings in Principal Component Analysis to find the variables which had more impact on the QOL. Since the pandemic taught new normal lifestyle parameters such as social distancing the collision created by the health outbreaks had a long way to set off.

FUTURE IMPLICATIONS OF THIS RESEARCH:

This research study can be further extended to know selective demographic factors such as type of residence and occupation influence the perception of individuals during Post-Covid 19 pandemic.

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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