



A CROSS-SECTIONAL STUDY TO ASSESS THE QUALITY OF LIFE AND MENTAL WELL-BEING OF WORK FROM HOME EMPLOYEES UNDER THE PRIVATE SECTOR DURING COVID-19 PANDEMIC IN TAMIL NADU

Community Medicine

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ABSTRACT

Background: Remote workers tend to live sedentary lives and lack social interaction. The fact that employees can work from home sometimes leads to increased fatigue, headaches, muscle pain, stress, and sleep disruptions. In light of these circumstances, we conducted this study to determine the quality of life and mental health of corporate employees working at home during the COVID 19 pandemic. **Methodology:** The study was conducted among 228 work-from-home employees in Chengalpattu district, Tamil Nadu in June 2021. A Google survey form was used to collect the data using WHOQOL BREF and DASS21 scales. Data was entered into an excel spreadsheet and analyzed using SPSS. We used proportions and mean \pm SD for categorical and continuous variables. The chi-square test and Pearson correlation test were used. **Results:** Psychologically significant mean scores were found for people under the age of 20-30 years and people in joint families of 54.87 ± 11.65 & 56.79 ± 11.49 , respectively. 31% of the participants had mild to extremely severe depression. QOL and DASS 21 showed negative correlations. **Conclusion:** There were a significant number of participants who suffered from depression, anxiety, and stress. Members of the joint family had a better quality of life.

KEYWORDS

Work from home employees, QOL, DASS 21

INTRODUCTION

The COVID-19 pandemic has altered every aspect of our work and life. Because of national and local containment policies, companies, organizations, and institutions encouraged their employees to work from home. In the early 2000s, telecommuting technologies contributed to the development of work from home (WFH). Workers could eliminate commuting, be more flexible, and achieve a better work-life balance by working at home. (1,2)

WFH allows employees to choose to work at times when they are most productive, and WFH can be beneficial for avoiding distractions from co-workers, especially in open-plan offices(3). When factors such as Indoor Environmental Quality (IEQ) (e.g., lighting temperature humidity air quality noise ergonomics etc are important for the physical and mental health of the workers, worker may have more control over these factors"(4). Particularly IEQ factors affect a worker's comfort which in turn affects their satisfaction"(5).

Despite the benefits of full-time WFH, there are numerous negative aspects as well. Employees who work from home are less likely to mingle with co-workers and may engage in fewer physical activities, such as walking between meetings (1). Due to extended hours, lack of or unclear delineation between work and home, and lack of support from the organization, blurring physical and organizational boundaries between work and home can negatively impact mental and physical health(6). It is possible that employees are required to work longer hours than their regular schedules, resulting in eye fatigue, headaches, musculoskeletal pain, stress, and sleep disturbances. Until the COVID-19 outbreak, WFH was not a prevalent method of working. The majority of employees who have never worked outside of the office have experienced WFH for the first time. WFH may become long-term or even permanent because of the uncertainty regarding when the pandemic will finish and possible COVID-19 contagion waves(7). Numerous studies have been done on WFH, but few have evaluated the quality of life and mental well-being of employees doing work from home during the covid 19 pandemic.

MATERIAL & METHODS

Study design: A Cross-sectional study

Study setting: Private employees doing work from home in Chengalpattu district, Tamil Nadu

Study duration: August 2021- October 2021

Study population: People who are at work from home under the Private sector in Chengalpattu district.

Sampling technique: The current study combined a snowball sampling technique with a cross-sectional, web-based survey and recruited 228 remote workers who began to work from home for the first time after the COVID-19 pandemic has been declared.

Therefore, the snowball sampling method, which is a non-probability (purposeful) sampling method was used in this study. Survey and informative forms (names of researchers and their institutions, scope, and purpose of the study, participation criteria, data privacy commitment form, and survey instruments) were transferred to an online questionnaire. All responses were anonymous and no personally identifiable information was requested. The primary inclusion criteria for the participants were no remote working experience before the COVID-19 pandemic, and WFH at the time of the questionnaire.

Sample size:

Sample size = 228 with 90% Confidence level and 70% precision from the previous literature, above sample size, is calculated by using Open Epi software.

Inclusion criteria: The employee, who had spent most of his/her work time at an office desk and had transitioned to WFH due to the COVID-19 pandemic and those who are willing to participate in the study.

Exclusion criteria: Those who already taking medication for any illness are not included.

Operational definitions: The private sector constitutes the segment of the economy owned, managed, and controlled by individuals and organizations seeking to generate profit. Companies in the private sector are usually free from state ownership or control.

The International Labour Organisation (ILO) defines telework as the use of information and communications technologies (ICTs) including smartphones, tablets, laptops, or desktop computers for work that is performed outside the employer's premises(8).

The World Health Organization (WHO) has defined "QOL" as "an individual's perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards and concerns"(9).

The short version of the Depression Anxiety Stress Scale-21 (DASS-21) was developed to provide a self-report measure of anxiety, depression, and stress signals(10).

Study instruments:

A semi-structured questionnaire was prepared to contain the socio-demographic details. We used the English version of the WHOQOL-BREF questionnaire to assess the QoL of the respondents(11) and the DASS-21 to study the perceived depression, anxiety, and stress of the respondent(12).

Data collection:

Employees from the private sector and residents of Tamil Nadu, who had spent most of their work time at an office desk and had transitioned to WFH due to the COVID-19 pandemic were included. Data was collected through Online mode (Google Form), after necessary permission from employees who were willing to participate. After completion of the survey, the respondents were encouraged to share the link with eligible contacts.

Data analysis

Google form responses were downloaded in MS excel 2019, Analysed using Statistical Package for Social Sciences version 25. Categorical variables (sociodemographic & occupational characteristics) summarised as frequency & percentages. Continuous variable (WHOQOL Scores & DASS-21 scores) summarised as mean & standard deviation. Independent 't'-test & One-way ANOVA were used to identify the association between baseline characteristics with WHOQOL scores. Pearson correlation was used to identify the correlation between individual domains of WHOQOL scores and DASS-21 scores.

Ethical issues

Ethical clearance was obtained from the Institutional Ethics Committee of Karpaga Vinayaga Institute of Medical Science and Research Centre, Chengalpattu District, Tamil Nadu. The purpose of the study was explained to the respondents, informed consent was

included as part of the Google survey form.

RESULTS:

Table 1: Distribution of Baseline characteristics of the Respondents (N = 228)

Variable		Frequency N =228	Percentages
Gender	Male	146	64
	Female	82	36
Age group in years	20-30	141	61.8
	31-40	62	27.2
	41-50	25	11.0
Marital status	Married	146	64
	Unmarried	82	36
Type of family	Nuclear	165	72.4
	Joint	63	27.6
Income per month	<50000	134	58.8
	50000 – 100000	76	33.3
	100000 – 200000	18	7.9
Working shift	Day	154	67.5
	Night	9	3.9
	Both	65	28.5
Sleeping hours	≤8hrs	148	64.9
	>8hrs	80	35.1
Working hours	≤8hrs	69	30.3
	>8hrs	159	69.7

As shown in Table 1, the majority of respondents were male (64%) and 62% were in the 20-30 years age bracket. 64 % were married, 72% lived as a nuclear family and 59% of respondents earn less than 50,000 per month. The majority of them were about in Day shift, of them nearly 70% of the individual working >8hrs. 65%percentage of individuals had sleeping patterns of less than 8hrs.

Table 2. Summary scores of Domains of WHOQOL & their Pearson correlation

Domain Sub scale	Mean ± SD	General health	Overall QOL	Environmental QOL	Social Relationship QOL	Psychological QOL	Physical QOL	P Value
Physical QOL	62.42 ± 13.52	0.365**	0.473**	0.582**	0.498**	0.588**	1	0.000
Psychological QOL	53.78 ± 12.72	0.402**	0.555**	0.629**	0.449**	1		
Social Relationship QOL	67.50 ± 16.52	0.371**	0.456**	0.580**	1			
Environmental QOL	52.35 ± 11.48	0.405**	0.508**	1				

** Correlation is significant at the 1% level

Table 2 Shows the Karl Pearson correlation between the individual domain of Quality of life (QOL), general health and overall QOL On comparing the four domains of the respondent, the social domain score

was the highest with a mean score of 67.50 ± 16.52, while the environmental domain was the lowest mean score of 52.35 ± 11.48. The four domains, overall QOL, and general health were highly significant and positively correlated with low to moderate relationships (r=0.30–0.58, P=0.000).

Table 3. Distribution of WHOQOL Domains among Basic line characteristics (N=228)

Socio demographic variables	Physical	P value	Psychological	P value	Social	P value	Environmental	P value	
Age	20-30	62.35 ± 13.97	0.538	54.87 ± 11.65	0.016*	65.23 ± 16.83	0.029*	52.47 ± 11.64	0.661
	31-40	63.56 ± 13.98		54.08 ± 11.80		71.18 ± 15.57		51.48 ± 10.86	
	41-50	60.00 ± 9.26		46.96 ± 18.16		71.24 ± 15.25		53.92 ± 12.34	
Gender	Male	62.06 ± 14.52	0.589	53.40 ± 12.81	0.548	66.95 ± 17.44	0.502	52.15 ± 12.22	0.715
	Female	63.07 ± 11.59		54.46 ± 12.61		68.49 ± 14.79		52.73 ± 10.09	
Type of family	Nuclear	61.88 ± 14.25	0.324	52.64 ± 13.01	0.027*	66.04 ± 16.36	0.030*	51.87 ± 11.59	0.295
	Joint	63.86 ± 11.37		56.79 ± 11.49		71.33±16.43		53.65 ± 11.18	
Marital status	Married	62.29 ± 12.93	0.846	53.02 ± 12.61	0.227	70.08 ±15.78	0.000*	53.18 ± 11.58	0.152
	Un-married	62.66 ± 14.59		55.15 ± 12.89		61.51 ± 16.18		50.90 ± 11.23	
Sleeping hours	≤8hrs	62.16 ± 13.12	0.683	54.98 ± 10.61	0.054	67.57 ± 16.39	0.931	52.84 ± 9.77	0.394
	>8hrs	62.93 ± 14.31		51.58 ± 15.75		67.38 ± 16.85		51.48 ± 14.15	
Working Hours	≤8hrs	65.75 ± 11.63	0.014*	55.97 ± 9.66	0.088	70.03 ± 12.53	0.129	54.64 ± 9.61*	0.048
	>8hrs	60.98 ± 14.05		52.84 ± 13.76		66.41 ± 17.90		51.38 ± 12.10	
Working shift	Day	62.62 ± 13.22	0.099	52.68 ± 12.63	0.121	66.86 ± 16.53	0.067	52.29 ± 11.01	0.023*
	Night	71.00 ± 13.32		59.22 ± 7.20		80.00 ± 11.19		62.33 ± 10.82*	
	Both	60.77 ± 13.98		55.66 ± 13.25		67.29 ± 16.60		51.15 ± 12.16	

* Consider the level of significance at 5%

Table 3 shows that the People who work for less than 8hrs had a higher mean score of 65.75 ± 11.63 found to be statistically significant with the physical domain of QOL. People in the age group of 20-30 years and people who were in under joint family had higher mean scores of

54.87 ± 11.65 and 56.79 ± 11.49 respectively found to be statistically significant in the psychological domain. The participant under the age group of 41-50 years, who were in a joint family, married participants were having a higher mean score of 71.24±15.25, 71.3±16.43, 70.08 ± 15.78 respectively found statistically significant with the social domain. The study participant who was at night working shift had a

higher mean value of 62.33 ± 10.82 found statistically significant in the environmental domain.

Table 4. Summary Scores of DASS 21 Subscale

	Depression (n=228)	Anxiety (n=228)	Stress (n=228)
Normal	157 (68.9%)	157 (68.9 %)	186 (81.6 %)
Mild	27 (11.8%)	11 (4.8%)	12 (5.3 %)
Moderate	24 (10.5%)	27 (11.8%)	14 (6.1 %)
Severe	9 (3.9%)	12 (5.3 %)	13 (5.7%)
Extremely Severe	11 (4.8%)	21 (9.2 %)	3 (1.3%)

*Mean value of DASS 21 subscale score were highest for Stress, followed by Depression and Anxiety

Table 5: Distribution of various levels of Depression, Anxiety and Stress.

Levels of subscales	Mean \pm SD
Depression	7.22 \pm 8.41
Anxiety	6.29 \pm 8.41
Stress	7.51 \pm 8.72

Table 5 shows that 31% of the study population had various levels of depression, among whom approximately 9% have severe and extremely severe forms of depression. 31% of the study population had various levels of Anxiety, among whom approximately 14% have severe and extremely severe forms of anxiety. 19% of the study population have different forms of stress.

Table 6. Karl Pearson Correlation between scores of the World Health Organization Quality of Life (WHOQOL) domains and the depression, anxiety, and stress scale (DASS-21) subscales.

WHOQOL Domains	DASS - 21 Subscales					
	Depression	P value	Anxiety	P value	Stress	P value
Physical	-0.276	0.000*	-0.308	0.000*	-0.302	0.000*
Psychological	-0.210	0.001*	-0.193	0.003*	-0.149	0.024
Social	-0.376	0.000*	-0.356	0.000*	-0.402	0.000*
Environmental	-0.363	0.000*	-0.346	0.000*	-0.352	0.000*

* Correlation is significant at the 0.01 level

Table 6 shows that a Correlation was observed (-0.149 to -0.402) between all subscales (Depression, Anxiety, Stress) of DASS-21 and all individual Domains (Physical, Psychological, Social, and Environmental) of QOL.

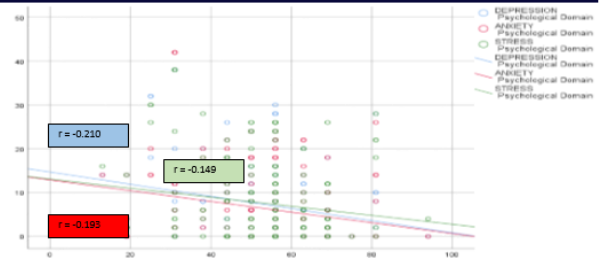
We are found highly significant among all subscales (Depression, Anxiety, Stress) of DASS -21 and all individual Domains (Physical, Psychological, Social, and Environmental) of QOL, except with psychological and stress.

Graph 1: Scatter plot depicts Correlation between the Physical Domain scores of Quality of Life and DASS (Depression, Anxiety, and Stress) scores.



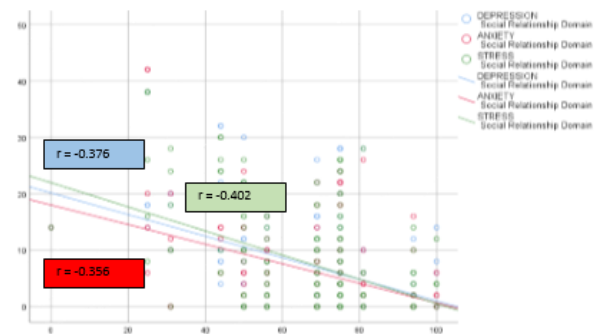
The scatter plot shows that the mean score of quality of life is inversely proportional to the DASS score, indicating that a higher quality of life score provides a lower or better environment for DASS (Depression, Anxiety, and Stress).

Graph 2: Scatter plot depicts Correlation between the Psychological domain scores of Quality of Life and DASS (Depression, Anxiety, and Stress scores).



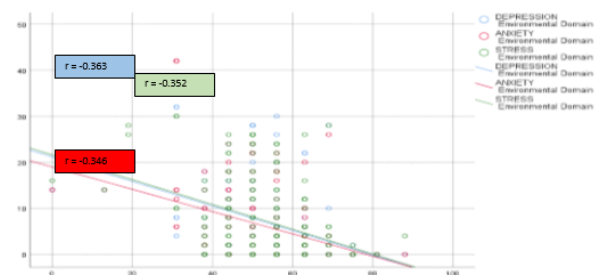
The scatter plot shows that the mean score of quality of life is inversely proportional to the DASS score, indicating that a higher quality of life score provides a lower or better environment for DASS (Depression, Anxiety, and Stress).

Graph 3: Scatter plot depicts Correlation between the Social domain scores of Quality of Life and DASS (Depression, Anxiety, and Stress) scores.



According to the scatter plot, the mean quality of life score is inversely related to the DASS score, meaning a higher quality of life score leads to a lower or better DASS score (Depression, Anxiety, and Stress).

Graph 4: Scatter plot depicts Correlation between the Environment Domain scores of Quality of Life and DASS (Depression, Anxiety, and Stress) scores.



Based on this scatter plot, we can conclude that the mean score of quality of life is negatively correlated with the DASS score, implying that a higher quality of life score is associated with a lower or better environment for DASS.

DISCUSSION

Working from home (WFH) has been implemented as part of a comprehensive public health initiative to prevent the spread of Covid 19. Despite being introduced suddenly, WFH will likely remain in place for some time, and organizations will rely on this policy to ensure necessary physical distances are maintained to prevent further outbreaks of COVID-19. Studying the impact of WFH on quality of life and mental health outcomes is a vital step in developing guidelines to help employers produce optimal working conditions.

There were a total of 228 respondents in the study, and the mean age of respondents was 30.70 ± 7.05 , but the mean age in the study conducted by E Senturk et al. was slightly higher at $35.64 \pm 6.84(13)$. The study conducted by E Senturk et al showed 55% males, whereas this study showed 64% males(13). According to our study, about 60% of the participants earned less than 50000 per month, while only 30% of the participants earned less than 50000 per month in the study done by Xiao et al(14). We found that the social domain score was highest in our study with a mean score of 67.50 ± 16.52 , while in the study done by

Wong et al the physical domain scored the highest with a mean score of 70.83 ± 12.69 , with an identical finding, the environmental domain having the lowest mean score (15). We found that overall QOL and general health were positively correlated with low to moderate relationships, similar to the finding of Wong et al study(15).

Study findings on depression, anxiety, and stress According to the DASS-21 Scale, 31% of the study population experienced depression at various levels, with 9% experiencing severe or extremely severe depression. Anxiety was present in 31% of the study population, with 14% having severe and extremely severe forms. An estimated 19% of study participants are stressed in some way. According to the study conducted by E Senturk et al, 17.9% of participants had various levels of depression. These levels included mild depression in 10.7%, moderate depression in 7.0%, and severe depression in 0.2%. The study also revealed 19.6% of participants had various levels of anxiety. On average, 12.9% of participants experienced mild anxiety, 6.1% suffered moderate anxiety, and 0.6% reported severe anxiety. 19.6% of participants reported various levels of stress. Mild stress was reported by 19.4% of the respondents, while moderate stress was reported by 0.2% of them(13).

As in Joo GS et al study (16), we found negative relationships between all DASS-21 subscales (Depression, Anxiety, Stress) and all QOL domains (Physical, Psychological, Social, and Environmental). The strongest correlations were between anxiety and the physical domain ($r = -0.308$, $p = 0.01$), depression and the psychological domain ($r = -0.210$, $p = 0.01$), stress and the social domain ($r = -0.402$, $p = 0.01$), and depression and the environmental domain ($r = -0.363$, $p = 0.01$). Nevertheless, this finding differs from that of Joo GS et al., who found that depression and the psychological domain were significantly associated ($r = 0.520$, $p = 0.001$), followed by stress and the psychological domain ($r = 0.496$, $p = 0.001$)(16).

CONCLUSION AND RECOMMENDATION:

Employees who belonged to a joint family had more positive feelings and a better relationship with each other than those who hailed from nuclear families. Environmental factors were moderately correlated with psychological factors. As a result, factors such as an improved home environment can contribute to changes in psychological factors such as concentration and beliefs. Employees who had positive QOL scores across all four domains were better off in terms of their mental health.

There is a need for more organizational support given the low scores in the Psychological and Environmental domains as well as significant proportions of severe and extremely severe depression, anxiety, and stress.

Employers should implement programs to ensure job security, streamline work hours so that employees can maintain a work-life balance, encourage social interaction between employees, and provide ergonomic workstations.

Limitation:

The current study had some limitations since it was a cross-sectional study, and only a relationship could be implied, not a causal relationship. Snowball selection may have constrained the number of representative study participants. A web-based self-report was used rather than an in-person interview. Although random sampling is difficult in a situation like the COVID-19 pandemic, web-based sampling is a preferred alternative. Additionally, re-sharing the survey link could lead to bias with high uniformity.

REFERENCES

1. Tavares AL. Telework and health effects review. *IJH*. 2017 Jul 11;3(2):30.
2. Bouziri H, Smith DRM, Descatha A, Dab W, Jean K. Working from home in the time of COVID-19: how to best preserve occupational health? *Occup Environ Med*. 2020 Jul;77(7):509–10.
3. Kim J, de Dear R. Workspace satisfaction: The privacy-communication trade-off in open-plan offices. *Journal of Environmental Psychology*. 2013 Dec;36:18–26.
4. Samani S. The Impact of Personal Control over Office Workspace on Environmental Satisfaction and Performance. *Journal of Social Sciences and Humanities*. 2015 Jan 1;1:163–73.
5. Al HSA et. Impact of Poor Indoor Environmental Quality (IEQ) to Inhabitants' Health, Wellbeing and Satisfaction. *International Journal of Advanced Science and Technology*. 2020 Mar 26;29(4s):1284–96.
6. How Effective Is Telecommuting? Assessing the Status of Our Scientific Findings - Tammy D. Allen, Timothy D. Golden, Kristen M. Shockley, 2015 [Internet]. [cited 2022 Jun 9]. Available from: <https://jour.nals.sa.gpub.c om/doi/fu ll/10.1177/ 1529100615 593 273>
7. Xxx K, Mruthyanjaya R, Mruthyanjaya Rao M. A General Linear Model Approach: Development Of Psychological Well-Being, Remote Working, Employee Engagement,

- Job Satisfaction, Scales, Data Analysis And Reporting Concerning To Information Technology Sector. *Journal of Contemporary Issues in Business and Government*. 2021 Jan 1;27:2021.
8. Working anytime, anywhere: The effects on the world of work [Internet]. Eurofound. [cited 2022 Jun 9]. Available from: <https://www.eurofound.eu/publications/report/2017/working-anytime-anywhere-the-effects-on-the-world-of-work>
9. WHO Quality of Life Assessment Group. What quality of life? *World Health Forum* 1996 ; 17(4) : 354-356 [Internet]. 1996; Available from: <https://apps.who.int/iris/handle/10665/54358>
10. (PDF) Anxiety, Depression, and Tension/Stress in Children [Internet]. [cited 2022 Jun 9]. Available from: https://www.researchgate.net/publication/225351134_Anxiety_Depression_and_TensionStress_in_Children
11. World Health Organization. The World Health Organization quality of life (WHOQOL) - BREF [Internet]. 2012 revision. Geneva: World Health Organization; 2004. Available from: <https://apps.who.int/iris/handle/10665/77773>
12. Lovibond SH, Lovibond PF, Psychology Foundation of Australia. Manual for the depression anxiety stress scales. Sydney, N.S.W.: Psychology Foundation of Australia; 1995.
13. Şentürk E, Sağaltıcı E, Geniş B, Günday Toker Ö. Predictors of depression, anxiety and stress among remote workers during the COVID-19 pandemic. *Work*. 2021;70(1):41–51.
14. Impacts of Working From Home During COVID-19 Pandemic on Physical and Mental Well-Being of Office Workstation Users - PMC [Internet]. [cited 2022 Jun 9]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7934324/>
15. Wong FY, Yang L, Yuen JWM, Chang KKP, Wong FKY. Assessing quality of life using WHOQOL-BREF: a cross-sectional study on the association between quality of life and neighborhood environmental satisfaction, and the mediating effect of health-related behaviors. *BMC Public Health*. 2018 Sep 12;18(1):1113.
16. Joo GS, Devan DMO, Qi CS, Patil SS. Association between depression, anxiety, stress and perceived quality of life in a Malaysian B40 urban community during the COVID-19 lockdown: A cross-sectional study [Internet]. *F1000Research*; 2021 [cited 2022 Jun 9]. Available from: <https://f1000research.com/articles/10-693>